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ORIGINAL ARTICLES.

MAN AND MACHINES: CLINICIANS AND TECHNICAL CONTRIVANCES FOR THE DIAGNOSIS OF TUBERCULOSIS OF THE LUNGS.

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Industry is being perturbed, now as in the past, by the opposing claims of manufacture by manual and by mechanical means; medicine, too, has to face the fact that machines in the form of technical contrivances have established their claims to places in the diagnostic sun on the ground that by means of them mistakes in diagnosis and much waste of time by too trustful reliance for ætio-diagnosis upon symptomatic study and clinical investigation may be avoided.

It is interesting to question why it is that when new types of investigational contrivances are brought forward and demonstrated to be clearly superior to older ones there are so many champions of the latter who go so far as wantonly to disparage what is new without making trial. No doubt the basis of this attitude for reasonable people is the righteous one that the older means of investigation have been subjected to personal trial by many different observers and the newer ones have not yet gone through that ordeal. But there must be something of "original sin" as well to account for the opposition of those who, not having tried the newer methods themselves, take trouble to spread about the dissident views published by observers whom they have never met and never known, and even to act upon their criticisms. This criticism by proxy from the armchair by "middle men" explains why it is that the bacteriological and skiagraphic workers—"the men

working on the land"—now deal with the family doctor directly; they are willing, perhaps even wishful, to suppress the "middle men," the clinicians, especially those who are so wantonly critical by proxy. No doubt hesitation to accept some of the newer methods of investigation is due also in part to the expense of such methods; the plessor and pleximeter and the stethoscope, which too long have reigned pontifically supreme as mechanical means of ætio-diagnosis in tuberculosis of the lungs, are cheap and very portable; not so the paraphernalia of a bacteriological laboratory and of a skiagraphic installation.

Phanerobacillary Sputum.

At any rate, the expense to the patient for an examination of the sputum is not very great—a few shillings each time—and many local public authorities will examine sputum for tubercle bacilli for nothing. Then why do practitioners so frequently ignore the advantage of having the sputum examined in every case of expectoration?

The trite answer is that it would be ridiculous to insist on the microscopic examination of the sputum of every patient who expectorated. Why should the sputum of a patient who has been suffering for a few days only from expectoration be examined for tubercle bacilli? And especially why should it be so examined if there are present none of the especially ætio-diagnostic symptoms of tuberculosis of the lungs such as hæmoptysis, wasting, sweating, etc., and no signs pathognomonic of that disease are discoverable at the apices of the lungs?

The answers are that clinical experience shows that some of these cases of recently manifested and apparently trivial disorders are really cases of tuberculosis of the lungs which are in such an early manifestational state that no symptoms especially suggestive of tuberculosis of the lungs exist, and no clinical signs especially suggestive of that disease can be discovered in the lungs; and further, that now it is freely admitted that the symptoms and signs considered so long by some to be pathognomonic of tuberculosis of the lungs can be manifested by non-tuberculous conditions.

Without any doubt whatever it must be insisted upon that routine examination of the sputum of all cases of expectoration should be made. Although this statement will provoke opposition from academic pontifically-minded clinical teachers and examiners in medicine, it certainly will win approval from the practically minded clinicians who are aiming at reduction of the symptoms and mortality of tuberculosis of the lungs. Superintendents of sanatoria, tuberculosis officers and hospital physicians will approve of it, because whether they order such routine examination of the sputum themselves personally, or whether such examinations are automatically ordered by others as part of a

routine, no sanatorium, no clinic, and no hospital would be considered to be satisfactorily run unless the sputum in each and every case were examined for tubercle bacilli and more than once, whether it was scanty or copious, mucoid or purulent, bloodstained or not, occasional or constant, and even in some cases unless it is subjected to test by guinea-pig inoculation. To such an extent has experience shown the value of the bacteriological study of the sputum of all expectorating patients that I am convinced that it is most important from the point of view of diagnosis to examine at once and repeatedly all sputa for tubercle bacilli as well as to encourage periodic symptomatic confessions and periodic submission to clinical examination of the lungs.

Bacteriological examination of the sputum, however, has its limitations. If the sputum shows tubercle bacilli once and only once, or even on several occasions, or on many examinations, the deduction should be given up that the patient at the moment is necessarily the victim, *qua* the expectoration of tubercle bacilli of evolutive intensifying tuberculosis of the lungs. The only proofs that a patient is the victim of evolutive tuberculosis of the lungs are the progressive increase of attributable symptoms and (or) the progressive increase of attributable abnormal pulmonary signs, and (or) the progressive increase of certain abnormal skiagraphic signs.

The progressive increase of tubercle bacilli in the sputum may be expressive of a malign lesional increase in size and (or) in number, but it may also be the expression of a benign lesional diminution in size and (or) in number accompanied by increased exfoliation of the cause—the tubercle bacilli; the converses are equally true.

It is clear that the use of the machine or technical contrivance—the bacteriological examination of the sputum—as a means of ætio-diagnosis in every case of expectoration has come to stay, judging by the practice of those whose duty it is to study the disease closely with a view to effecting its arrest; positive results when obtained are absolutely reliable evidence of the fact of the presence of a tuberculous lesion or lesions; mere reliance upon the study of symptoms and upon the study of certain clinical signs in the lungs as a means by which ætio-diagnoses may be made in diseases of the lungs is becoming a moribund practice; there should be few mourners at its decease.

Not for one moment, however, must it be thought that the use of bacteriological examination of the sputum should do away with the study of symptoms and clinical signs, because the study of symptoms and (or) the detection of clinical signs may be the only means available—however inadequate they are for such purposes in some cases—by which we can assess that a lesion or lesions present in the lungs possibly shown to be tuberculous by positive sputum examination are evolutive, involutive, or stationary. Further, the study of symptoms and

(or) the detection of clinical signs may be the only means available for proving that the lung is diseased at all; the anatomy of the lesion causing pain in the axilla on breathing may be discoverable only by clinical examination to be due to inflammation of the pleuræ, when an appeal to bacteriological and (or) to skiagraphic study may be useless for such purpose.

Skiagraphic Examination.

But the study of symptoms and of signs does not necessarily afford completely reliable criteria of the involutive or evolutive trend of the lesions in the lungs; nor is bacteriological study the only means of making an accurate ætio-diagnosis. Fortunately for medicine, skiagraphy has come to render invaluable assistance in these two matters. Here is a machine or technical contrivance "with a vengeance," which in certain circumstances can unaided outstrip in accuracy of anatomical diagnosis all semeiotic (symptomatic and clinical) manifestations, and in cases of non-productive inflammation of the lung in which bacteriological examination of the sputum cannot be employed and in certain cases of productive but aphanobacillary tuberculosis of the lungs can unaided provide a correct ætio-diagnosis. The youth who complains of a sore throat or of a cold in his head or of a touch of "Flu" may yield no physical signs of changes in his lungs (supposing the medical attendant has learnt that it is advisable in all cases of such trivial maladies to examine them), and the sputum expectorated may reveal no tubercle bacilli (supposing the medical attendant has also learnt the necessity for the routine examination of the sputum of all cases when available), and yet this youth may on skiagraphic examination reveal a causally associated tuberculosis of the lungs in such a state that arrest by modern appropriate treatment may be certain.

In many towns and cities skiagraphic installations are available at hospitals, but the officers responsible for recommending skiagraphic examination of cases should not, on the ground of cost, have to try to discriminate, by a study of the symptoms and signs, between those who are likely and those who are not likely to yield positive skiagraphic evidence of pulmonary change.

If it is found impracticable by a private patient, or by his or her relatives, on the ground of expense to have skiagraphic examination made, the patient or the patient's relatives should be told by the medical attendant that he must not be held responsible for missing the presence of tuberculosis of the lungs should this disease declare itself more fully in the near or remote future.

Idioskiastic Manifestations of Tuberculosis of the Lungs.

If the very definite purpose of this article so far has been to seek unrelentingly, whilst maintaining symptomatic and clinical study upon

their pedestal of worthy modest height as indicators of anatomical changes of some kind in the lungs, to dislodge them entirely from the lofty ætio-diagnostic pedestal upon which they have climbed, and where some would still keep them, to the great detriment of the patient, and also as unrelentingly to seek to dislodge from another lofty pedestal to a lower, more modest one the ætio-diagnostic and prognostic omnipotence of positive and negative bacteriological examinations of the sputum, another purpose must be declared. After a very slow and painful personal conversion I have been won over to the belief that skiagraphic examination of the lungs can in certain cases most assuredly give, when repeated, a full ætio-diagnostic, almost perfect anatomico-diagnosis and within limits valuable prognosis in cases of tuberculosis of the lungs.

Those readers who are obliged to rely upon the reports issued by skiagraphers know that some of them do not hesitate to make a type-written statement that the lung (or lungs) is the seat of tuberculosis; in short, these observers are convinced that idioskiastic manifestations occur in the lungs when affected with tuberculosis, whatever may be, or may not be, the symptomatic, clinical and bacteriological manifestations; others are far less certain, indeed do not believe that there are any pathognomonic skiastic manifestations of tuberculosis of the lungs, and they content themselves with the identification of the anatomical changes which are responsible for the abnormal shadows present; such workers restrict themselves in their reports to the study of the anatomy and not of the ætiology of the pulmonary changes.

A third type of skiagraphers offer typewritten reports which, like the above, may even reach the hands of the patient or the patient's friends, for skiagraphic examination is costly and a typewritten report is "something for your money"; these reports being non-committal are examples, however, of the pernicious practice of naming special diseases, including such desperate ones as malignant disease and tuberculosis of the lungs, as well as other conditions which *may* cause the shadows; in other words, these skiagraphers do not hesitate to mention in writing several dire diseases which the clinician never even speaks of until he is sure that he has identified which of them is the cause of the patient's illness.

The more simple skiagraphic manifestations which are certainly pathognomonic of tuberculosis of the lungs include the following:

1. Changing apical mottling due to small and medium-sized moderately dense shadows ($\frac{1}{8}$ to $\frac{1}{4}$ inch in diameter) distributed irregularly and having ill-defined edges and followed, as may be shown in subsequent skiagrams, by intensification of the shadows of the bronchioles responsible for the ventilation of the area affected.

2. Single or multiple areas of changing extent of lung-rarefaction

occurring anywhere in the lung-field and presenting no line of demarcation, or only a narrow irregular one, separating them from adjacent lung-tissue.

3. Uniformly and bilaterally scattered, roughly uniformly sized small shadows ($\frac{1}{16}$ to $\frac{1}{8}$ inch in diameter) having ill-defined edges and moderate density diminishing to zero or to irregularly distributed but intensely dense shadows.

4. Mottling gradually developing as observed in repeated skiagrams around calcified foci in the parenchyma of the lung, due to small or medium-sized shadows ($\frac{1}{8}$ to $\frac{1}{4}$ inch in diameter) having ill-defined edges and light or moderate density.

These four simple skiagraphic appearances and (or) combinations of them indicate the fact that tuberculosis is responsible for their existence, but it is clear that only by repeated skiagraphic investigation can it be determined that the tuberculous process is involutive or evolutive.

There are several other simple types of manifestations due to tuberculosis which can be detected by skiagraphic examination, but, seeing that they may owe their existence to quite different infections or to malignant disease, etc., they cannot be included in this list of pathognomonic skiastic manifestations except as occasional accompaniments of them.

In conclusion it must be said that although the study of symptoms and of clinical signs has in the past led to correct diagnoses of tuberculosis of the lung, the number of correct diagnoses of the disease in a much earlier and arrestable stage can be greatly increased by the routine bacteriological examination of the sputum of all expectorating cases and by the routine skiagraphic examination of all cases presenting symptoms of disorder of the respiratory tract.

THE TREATMENT OF LARYNGEAL TUBERCULOSIS BY LIGHT: A REVIEW OF METHODS AND RESULTS.

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It is generally agreed that during the last fifteen years considerable advances have been made in the treatment of pulmonary tuberculosis and its complications. There are, however, two complications which stand out like ragged rocks to stem this tide of progress. One of

these, tuberculous meningitis, is relatively rare; the other, tuberculous laryngitis, is met with only too frequently. Both these complications are of very grave import. Even today it is doubtful if recovery has ever occurred from tuberculous meningitis; and all writers agree that the laryngeal complication seriously affects prognosis. It is in conditions such as these that divers methods of treatment are apt to be recommended and to lead ultimately to a war between different camps. A periodic and impartial review may possibly in such circumstances tone down the high lights and allow the methods to be seen in their true perspective.

The Incidence and Prognosis of Laryngeal Tuberculosis.

In discussing the value of artificial light in the treatment of laryngeal tuberculosis it is important to recognize the true incidence of the condition. Published figures vary according to the views of the observer and the types of the cases. Hawes[1] found only 8 per cent. of laryngeal complications among 1,245 patients suffering from pulmonary tuberculosis. StClair Thomson,[2] in a very extensive investigation, found that 18·7 per cent. of moderately early cases show the condition, and Dworetzky[3] found that 25·6 per cent. of cases had a laryngeal affection. In 1928 Looper and Schneider[4] found the complication to be present in 15 per cent. of 3,000 cases of pulmonary tuberculosis. In more advanced cases this complication is liable to be much more frequent. Kidd[5] stated that 50 per cent. of fatal cases of pulmonary tuberculosis showed tuberculous laryngitis at autopsy, and other records give this frequency at over 80 per cent. It is obvious, therefore, that the condition is quite common, and StClair Thomson[6] estimated that of all cases of pulmonary tuberculosis at least one in three develops this complication at some stage or other. A further point of importance is that laryngeal tuberculosis is practically always a secondary condition. The incidence of the disease is often stated to be much higher in males, but StClair Thomson showed that, other things being equal, the two sexes are affected equally. He also showed that, from the standpoint of prognosis, the development of the laryngeal condition automatically places the patient in a more advanced stadium. A follow-up of patients from one to ten years after their discharge showed that of laryngeal cases two were dead out of every three; whereas, of larynx-free cases, two out of every three were still alive.

Many methods have been used in the treatment of laryngeal tuberculosis. The earlier methods dated from the publication of Schmidt's paper in 1876, and consisted mainly in the local application of various antiseptics. Most of these have fallen into disuse, and those which have survived are now used purely symptomatically in an

attempt to relieve the distressing sufferings in advanced cases. Resort was next made to surgical measures for the excision of diseased tissue, but at the present day their use is limited. The galvano-cautery, which was recommended by Grünwald in 1907, is based on sound principles, and in suitable cases it is a method which is now practised with considerable success. The physiological rest to the larynx conferred by various degrees of voice-rest is now very widely employed, but the method calls for complete understanding between patient and physician. The operation of injection of the superior laryngeal nerve is still employed in certain cases. Heaf [7] gave a description of these different methods as applied to sanatorium work. As regards general treatment, Tovolgvi [8] argued that the infection of the larynx is due to contact with sputum rather than to blood infection, and he stated that there is an inverse relationship between the amount of coughing and the degree of infection of the larynx. Hence he advised that depressant drugs should not be used.

The prognosis of the condition has been very materially altered within recent years. Fifty years ago Morell Mackenzie stated that it was not certain that any cases ever recovered. StClair Thomson [2] in his remarkable series of cases obtained a cure in 119 out of 477 cases of laryngeal tuberculosis—*i.e.*, 25 per cent. In these the method of "whispers" was first used, and this was later followed in suitable cases either by complete silence or the galvano-cautery, or both. Of these methods the combination of "whispers" and the galvano-cautery seems to have been the most satisfactory.

Treatment of Laryngeal Tuberculosis by Means of Light.

In the treatment of this condition light was first used in 1904 by Sorgo [9] of Vienna. He employed a system of mirrors to reflect the sun's rays into the larynx. With his method the first exposure given is of five minutes' duration, and this exposure is gradually increased to one hour. Since the natural sun cannot be relied upon in this country, this method will not be further considered.

The epoch-making work of Finsen with artificial light opened up new avenues, which in the case of laryngeal tuberculosis developed mainly in two directions. Strandberg and his co-workers were the pioneers in the treatment of the condition by general light baths; and Wessely and others developed their work along the lines of local treatment. These two methods will be considered separately.

Treatment by Means of General Light Baths.

Strandberg,[10] in one of his earlier publications, gives reasons why he uses general light baths in preference to local treatment of the

larynx by light: (1) Very small quantities of light can be directed into the larynx itself. There is, however, considerable irradiation of surrounding parts, and this may in certain cases lead to undesirable reactions. (2) The mirrors which are employed in local treatment absorb a considerable amount of the rays. (3) There is a considerable distance between the source of light and the part to be treated. Strandberg later added the rather important objection that it is impossible to procure absence of blood from the larynx by these local methods. Critics of the Strandberg method point out (1) that burns of the larynx can be produced by overdosage during local irradiation of this organ; (2) that the use of glass mirrors, which reflect only 9 per cent. of the light, can be dispensed with by using mirrors of quartz or some alloy, or, alternatively, by irradiating the larynx directly, as in the method of Cemach; and (3) that, by suitable applicators or by other means, the light can be applied directly to the larynx.

Strandberg emphasizes the point that the best light for use in general irradiation is one which gives a continuous spectrum as in natural light. He uses carbon arc lamps, in which the lower carbons are as thin as possible. Two types of lamps are used by him at the Finsen Institute—one is of 75 amps. and the other of 20 amps. Both use a current of 55 volts, and Strandberg attaches some importance to this choice of voltage. When ambulant cases are being irradiated, six or eight of these sit around two of the 75 amp. lamps. For bed patients three 20 amp. lamps in line are employed; two patients are irradiated simultaneously, one lying on either side of the central lamp. Treatment begins with baths of five or ten minutes every day or every alternate day, and the dose is increased every second exposure until a maximum of two and a half hours is reached. It should be noted that in an earlier paper Strandberg[11] stated that for those without lung complications twenty-five to thirty minutes can be used as an initial exposure, but if pulmonary disease is present the initial dose should be ten to fifteen minutes. He advised that treatment should be continued for from six to sixteen months, or for a month or six weeks after all objective signs of laryngeal involvement have disappeared.

Of 203 cases which Strandberg treated as out-patients at the Finsen Institute, he claimed that 113 were clinically cured so far as the larynx was concerned—*i.e.*, 55·6 per cent. of cures.[12] A large section of this series of cases was analyzed by Plum,[13] who showed that this section consisted of men and women in the proportion of 3 to 2, but that the recovery rate for women was almost 50 per cent. higher than that for men. He suggests that this was due to the fact that men came later for treatment and had often to continue at work while treatment was in progress. Plum compares the high percentage of cures in this series with the results obtained by other methods—*e.g.*, Ruedi, 35·9 per

cent. of cures in 387 cases; Wessely, 28 per cent. in 164 cases; and StClair Thomson, 25 per cent. in 477 cases.

Strandberg later applied his method to patients in the Vejlefjord Sanatorium, with the expectation that the increased supervision and correct treatment of the lung condition would lead to even better results. Along with Gravesen[14] he reported upon 69 of these patients, of whom 47 had ulceration of the larynx and 22 infiltration only. In this group healing was obtained in 84 per cent. of the cases. Strandberg believes that these excellent results were due to the association of laryngologist with chest physician. It is well known that the laryngeal condition frequently shows marked improvement after the induction of an artificial pneumothorax.

It is important to note that Strandberg does not usually employ light as the sole agent in the treatment of these cases.[12] Apparently in many cases he also makes use of surgical measures, such as excisions or the galvano-cautery, and he places great stress upon the principle that operations should be performed only when the patient's general condition has shown considerable improvement.

Strandberg's results have recently been subjected to criticism by StClair Thomson.[15] The work was carried out at King Edward VII. Sanatorium, Midhurst, and the appliances used were the same as those employed at the Finsen Institute. The *modus operandi* was approved by Strandberg himself during a personal visit. During three years a total of 32 cases were treated. The author concludes that there was no striking evidence of benefit from the light treatment. The actual cases cured were 24, which gives 75 per cent. success. But all the cases were selected as being suitable for light treatment, and in most of the cured cases other methods of treatment—*e.g.*, galvano-cautery—were later employed to effect a cure. StClair Thomson had previously shown that in cases which were suitable for the galvano-cautery a cure could be effected in 64 per cent.

In discussing these results emphasis should be laid on the fact that Strandberg gives no figures for cases treated by light alone, and that in nearly all his cases the light treatment was used as a preliminary to, and also later to supplement, other measures of an operative nature. Hence it would seem that the discrepancy between the results of Midhurst and those of Copenhagen are more apparent than real. It is difficult, however, to avoid the conclusion that the method of treatment by general light baths, though it may help to raise the general resistance of the patient, is expensive and demands infinite patience, and that it can seldom be used alone as a mode of healing the laryngeal lesion. Heaf[7] from his great experience of sanatorium work concludes that Strandberg's method is only beneficial in patients with a good physique, and in whom the lung lesion is not considerable.

Local Application of Light to the Larynx.

The two great advocates of local treatment are Cemach, who uses a quartz mercury vapour lamp, and Wessely, who employs a carbon arc lamp of special design. Cemach[16] employed an apparatus which he later developed into his well-known Photostat. The apparatus consists of a stand carrying an adjustable bracket, the lamp, and a speculum. The patient lies on his back with his head hanging over the end of the couch. The speculum is inserted into the throat until the larynx is seen; the lamp—a Kromayer—is then swung into position and irradiation is carried out directly. Treatment is begun with an exposure of one or two minutes, and is increased at each exposure by a minute or two, until a maximum of ten minutes is given. Irradiation is carried out thrice weekly. For those who tolerate light well, he recommends a further course of treatment with a blue filter inserted, the maximum exposure for white light and blue light combined being twenty minutes. Cemach thinks that blue light is more penetrating in its effects, and that it produces better results where dysphagia is present. For his method of direct irradiation he claims that by its use infiltrates disappear completely, and ulcers heal and cicatrize. In this original paper Cemach claimed 17 cures out of 24 cases; but he excluded 7 cases who ceased treatment prematurely, although all were improving, and 11 cases who died while under treatment. Even if the 11 cases who died are included in the total cases 48 per cent. of cures are obtained—a very high figure. Cemach notes that the 17 cured cases differed from the others in that they showed marked cutaneous allergy.

Cemach admits that certain disadvantages are inseparable from this method of treatment. For example, the lesion may be shielded from the light by overlying tissue. Further, only a certain proportion of the rays actually reach the lesion, and the application of the method requires a trained technique. In a recent paper[17] he described a new instrument, by the use of which some of these disadvantages are overcome. The apparatus is a small water-cooled quartz lamp, which is somewhat sickle-shaped in appearance. The larynx is first anæsthetized with 20 per cent. cocaine, with or without adrenalin, and the lamp is ignited and then introduced over the back of the tongue into the larynx. If possible the end of the quartz tube is brought into contact with the lesion. Cemach claims that the technique can be learned rapidly by an operator; further, the lamp can be quickly withdrawn at intervals to allow the patient to cough and spit. The estimation of the dosage is largely a matter of experience. Cemach suggests an initial dose of forty seconds. On the following day the lesion is examined, and further dosage is determined by the extent and character of the reaction. It can usually be increased gradually to

100 seconds, and after four weeks or so, when cicatrization should be taking place, it can be rapidly advanced to 240 seconds. One advantage of this apparatus is that it allows of compression being employed during irradiation; in the larynx, however, this can only be carried out when the site of the lesion is in the epiglottis.

In his paper Cemach gives a general discussion of the results which may be expected, but he does not include any statistics. Apparently he uses light therapy largely as a means of preparation for operative measures—for example, the galvano-cautery—although he states that in certain cases a cure can be effected by the use of light alone. In more advanced cases a cessation of activity is about all that can be expected. Of the types of laryngeal tuberculosis, the ulcer is that which responds most readily to treatment. Infiltrations are much more refractory. Cemach also emphasizes the point that these methods of local treatment should be subsidiary to general methods, such as open air, diet, and artificial pneumothorax.

Wessely, the other great exponent of local therapy, described his method and results in a series of papers.[18-22] He holds that the special metallic carbons which he employs give a light which is very rich in the blue rays of the spectrum, and that the resultant product is a close approximation to the natural sun at an altitude of 2,000 metres. The special radiation machine which he designed enables this light to be cooled and projected in a narrow cone to a desired point. The patient may be irradiated either directly or indirectly. For direct irradiation the patient is suspended by means of the Seiffert direct universal laryngoscope, and the light is projected on to the lesion without reflection. Patients whose general resistance is not so good are irradiated indirectly; the patient is in the sitting position, and the light is reflected on to the larynx by means of a steel laryngeal mirror. Wessely claims that a third of his cases are healed locally, or are at least much improved. Beneficial results are seen especially in the case of superficial ulcers, which heal rapidly. Large infiltrations become smaller, though they may not disappear completely. Dosage varies from five to ten minutes according to the nature of the case, and irradiation is carried out several times weekly.

In America, Miller[23] used the Wessely technique in treating 74 cases. Only two of these did not show any response to treatment. Of the remaining 72 cases 59 showed complete healing of the laryngeal lesion.

Glenn and McGinnis[24] described the results of treatment of laryngeal cases in the Missouri State Sanatorium. The method used was the introduction into the larynx of an applicator consisting of a right-angled fused quartz rod. The source of light was a water-cooled quartz lamp. The initial exposure was ten seconds, and this was

increased by five seconds at each exposure until a maximum of thirty to forty-five seconds was reached. Treatment was carried out twice weekly, and each patient had an average of 28·3 exposures; 77 cases were treated; 35 of these were males and 42 females. The authors claim that in 89 per cent. of these a definite improvement was noticed. Dysphagia was relieved or cured, and cough and laryngeal irritation were lessened. Four cases were observed for six months before laryngeal treatment was begun, but, although the pulmonary condition improved, the state of the larynx remained unchanged. A marked improvement in the laryngeal condition was noticed after the commencement of the light therapy.

Katz[25] recently described his method, in which a rod-applicator attached to a Kromayer lamp is introduced through a direct laryngoscope into the larynx. He does not give details regarding his results, but he indicates his belief that the method is useful as an adjuvant to other forms of treatment.

Discussion of the Subject.

It will be evident that there is unanimity neither as regards the best method of applying ultra-violet light in laryngeal cases, nor as regards the results obtained. Most writers, including even those who are ardent supporters of the method, agree that to effect a cure by light alone is often impossible, or impracticable, owing to the time and patience involved. It would seem, however, that in suitable cases, and in the hands of expert laryngologists, the method may be useful as a preparation for measures such as the galvano-cautery. Both Strandberg and Cemach insist that operative measures may be disastrous if performed too early, and they are confident that light therapy helps to raise the patient's immunity preparatory to operation. It is questionable if these advantages outweigh the fundamental disadvantage that the treatment is costly, and requires infinite patience on the part of both patient and physician.

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INTRAVENOUS UROGRAPHY IN THE DIAGNOSIS OF TUBERCULOSIS OF THE KIDNEY.[1]

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THERE are two methods of visualizing the urinary tract by means of injecting contrast substances. The first and older method of instrumental pyelography is a purely anatomical one, whereas the second—intravenous urography—is both anatomical and physiological. In addition to detecting anatomical details it gives a picture of the dynamics of the urinary tract. Excretion urography is useful in that

[1] Presidential address to the North-Western Tuberculosis Society, Manchester, October 27, 1932.

it can be employed in cases where, owing to anatomical hindrances, such as stricture of the urethra, enlarged prostate, etc., instrumental pyelography cannot be performed.

The first attempt to delineate the urinary tract by means of intravenous injection was made in 1905 by von Lichtenberg. He used the colloidal heavy metals, but they were abandoned on account of their toxicity. It was not till 1923 that Rountree and his associates published the first positive results; they used a solution of sodium iodide and proved that intravenous urography was possible provided that a satisfactory contrast substance was found. Roseno was the first to attain clinical success. He used a urea-iodine combination. Zeigler and Koehler improved on this method by compression of the ureters as an adjuvant. This urea-iodine preparation was not generally adopted owing to the fact that it was not tolerated in all cases. The best substance for intravenous urography is one which is non-toxic and which will be in sufficient concentration to visualize the urinary tract with regularity and certainty.[1] The discovery of this substance was made after laborious research by a team of German workers. The chemistry was worked out by Binz and Raeth, and the physiological, clinical, and X-ray work was done by von Lichtenberg and his assistants. The name given to this substance was uroselectan B.

It is a complex organic chemical compound, a derivative of pyridin, and containing 51·5 per cent. iodine, the iodine being in close organic combination. Before uroselectan B was finally decided upon exhaustive trials were made with six other similar compounds, including abrodil and uroselectan, and reading an account of this work one is impressed by the thoroughness of their investigations and the numerous exhaustive tests employed before uroselectan B was finally adopted.[2]

Uroselectan B is put on the market by Schering in ampoules, each containing 15 grammes of uroselectan B dissolved in 20 c.c. of a 10 per cent. solution of invert sugar (a mixture of equal quantities of dextrose and lævulose). It is claimed that this invert sugar solution is hypertonic, and thus fluid passes from the tissues to the blood. In this way the absorption of uroselectan B by the tissues is hindered, with the result that excretion is increased and tolerance improved. In addition the drug contains the two iodine atoms in close organic combination, and it passes through the body without the liberation of iodine. The sterilized solution remains stable in the ampoules without undergoing any chemical change.

Uroselectan B is very readily soluble, and the injection of a large quantity of fluid is no longer necessary, 20 c.c. being sufficient for an adult as against 50 to 100 c.c of uroselectan, which is injected by the rather cumbersome method of funnel and rubber tubing. The ampoules are already sterilized ready for use, whereas with uroselectan the

preparation for injection involves filtration of the solution twice and subsequent sterilization. Uroselectan B can also be used as the contrast substance in cystoscopic pyelography.

The preparation of the patient consists of giving a dose of castor oil the evening before; the injection is done at 11 a.m. the following morning, after a light breakfast, and one hour before injection 10 ounces bovril are given. Immediately before the injection the bladder is emptied. Uroselectan B is apt to cause troublesome formation of gas in the large intestine, which tends to obscure the kidney outline in the skiagram. To avoid this I tried giving a washout of the lower bowel one hour before the injection; but this did not improve matters, and I think there was more gas formation in the bowel than in the cases which had the castor oil.

The injection is carried out in a similar manner to any intravenous injection. An ordinary 20 c.c. syringe is used and the contents injected slowly. Some recommend that the ampoule be warmed to the body temperature, but this is not necessary. It has been my practice to take a series of skiagrams at intervals of 5, 10, 20, and 40 minutes after injection.

Uroselectan B is very well tolerated. Patients usually experience a feeling of warmth, especially about the head, during the time the injection is made; this ceases immediately the injection is over. Occasionally nervous patients may take an excessive and apprehensive interest in the actual injection, but beyond this I have not observed any immediate or remote ill-effects. I have done it on out-patients and allowed them to go home after skiagrams have been taken. Severe reactions have been noted with the earlier contrast substances. After uroselectan symptoms of iodine poisoning have occurred—urticaria, œdema of face, thirst, cough, giddiness—probably due to the fact that the iodine in uroselectan is not in such firm combination as in uroselectan B and is liberated in the blood.[3] One or two fatal cases after uroselectan have been reported in patients who were previously seriously ill. Local thrombosis of the veins has been recorded, probably due to damage of the intima at the time of injection.

Intravenous urography is particularly useful in cases of tuberculosis of the kidney. There is frequently associated cystitis in which the bladder is very irritable and contracted, and the use of the cystoscope causes considerable pain; there may be swelling and constriction of the ureteric orifice, which renders the passage of the ureteric catheter difficult or impossible. It is especially useful in children where a general anæsthetic is necessary for instrumental pyelography. This is avoided by the injection of the contrast substance into the veins. In quite a number of my cases the serious general condition has been such that it would have been unfair to ask the patient to submit to an

instrumental examination owing to the other organs being infected. One case had involvement of the lungs, intestines, wrist, and ankle in addition to the kidneys. Again, there is no risk by the intravenous method of carrying the infection to the healthy kidney, but the greatest advantage of intravenous urography compared with instrumental pyelography is its simplicity—the employment of cystoscope and ureteric catheters, which require special technical skill for their use, are entirely obviated.

The skiagrams obtained by intravenous urography do not give such clear-cut pictures as those obtained by injecting sodium iodide from below.[4] On the other hand, they give a perfectly natural photograph. There is no overdistension of the renal pelvis. This may occur in instrumental pyelography unless the complete co-operation of the patient is obtained to give an indication when overdistension is about to occur. If a general anæsthetic is used this indication cannot be given at all.

When intravenous urography was first practised it was usual to apply some form of abdominal compression of the ureters by means of a tight binder in order to obtain better visualization of the contrast substance, but this has been generally abandoned as it tends to cause artificial distension of the pelvis and does not give a true picture of the condition of affairs. By compression, pictures are obtained which resemble those seen in cases where there is peripheral obstruction. Compression disturbs the physiological picture and inhibits the dynamics of the urinary tract, and the great advantage of intravenous urography over instrumental is the fact that a natural picture is obtained.

Abdominal compression has occasionally proved useful in cases where there is marked hypertonicity of the urinary system.

The skiagram obtained in an excretion urogram is that of a running stream—viz., the urine flow—and in disease the kidney may not be functioning, and thus there is no stream owing to the springs having dried up.

A series of photographs is necessary to obtain the fullest information, because in a single skiagram some part of the ureter or pelvis, or both, will be in systole, and that part will not contain any of the contrast substance. The only parts delineated in a given skiagram are those that are in diastole at the time of taking the urogram. The dynamics are constantly changing owing to peristalsis.

The ideal method of observing the excretion of uroselectan B would be by continuous screening of the patient, but unfortunately the density of the contrast substance does not permit this. Jarre has recorded a number of cases by means of the Cinex camera, using four exposures per second, and observes that a normal pelvic or ureteric outline may assume widely varying dimensions in a given study,

therefore the interpretation of the condition of affairs from a single film is erroneous.[5]

Cumming, in studies made on normal kidneys and ureters, has noted the following regular activities: Separate contractions of the calyces, infundibulum, and pelvis occur which follow no regular sequence; the ureteric contractions are segmental, the upper, middle and lower segments filling and emptying in sequence. Milking of

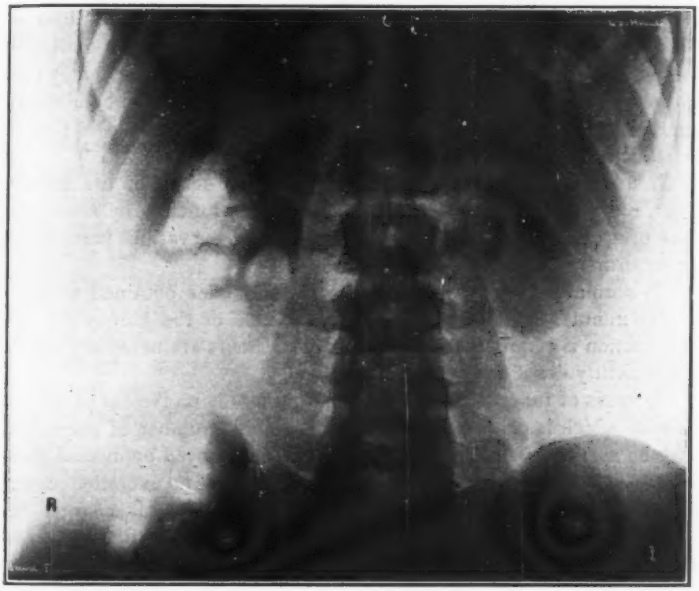
SKIAGRAM I.

None of the contrast substance is seen on the left side, thus demonstrating a functionless kidney on that side. On the right side there is dilatation of the pelvis and calyces and upper part of the ureter with kinking. The urine contained T.B.

the pyramids by calyces has been observed, and there is a tendency to form a bulb at the uretero-pelvic junction.[6] It will be seen from these changes that are constantly going on how necessary it is to take a series of skiagrams to avoid pitfalls. Bugbee and Murphy, whilst admitting the usefulness of intravenous urography, state that it is a method of corroboration to be employed as a supplement to our present known methods of urological diagnosis, except in a limited number of cases in which cystoscopic examination is impossible. Here they

consider it gives valuable information otherwise unavailable, but when such data are unsupported by cystoscopic examination interpretation must be made with extreme care and conservatism.[7]

Some workers have stated that they have observed the failure of normal kidneys to excrete the contrast substance. What does happen, as I will show later, is that there is failure to obtain in a single skiagram a complete picture of the whole pelvis and ureter. This is



SKIAGRAM II.

The outline of the pelvis and calyces is normal on the right side. On the left side there is little to be seen of the pelvis as such, and the lower calyces are irregular in outline and considerably dilated. There is also dilatation of the upper part of the ureter. Tuberculosis of the left kidney was confirmed at operation.

due to the fact that the contrast substance is seen only in those parts of the urinary tract that are in diastole. Those parts that are in systole at the time of the taking of the picture will not be visualized. It is generally admitted that the contrast substance in radiograms of normal kidneys does not show up so well as in those which are diseased. This is due to the fact that the contrast substance is excreted more rapidly in healthy kidneys.

By intravenous urography visualization of both sides of the urinary

tract and the relations between the various parts can be studied in a series of skiagrams. It is thus possible to demonstrate the presence of both kidneys and contrast their relative functional activity. It has been proved by animal experiment that uroselectan B is excreted by the glomeruli of the kidneys and not the tubules,[8] and before it passes into the renal pelvis the general outline of the kidney is often well seen owing to the contrast substance being present in the glomeruli of the kidney. As the uroselectan B passes to the calyces and pelvis and along the ureters any abnormality can be noted. In cases of tuberculosis of the kidney there is frequently seen irregularity of the outline of the pelvis and calyces and dilatation of the ureter. If the kidney substance is completely destroyed on one side no urogram will be obtained on that side. Five per cent. of uroselectan B in the urine is said to be sufficient to give a picture.

In addition to abnormalities in the size and shape of the urinary tract, information can be obtained of the kidney function by noting the time of appearance of the contrast substance in the various parts of the upper urinary tract.

In normal kidneys a good picture is sometimes obtained as early as five minutes after injection, but in tubercle of the kidney the rate of excretion is retarded and occasionally six hours are necessary before a sufficiently dense pyelogram is obtained.

In cases of tuberculosis of the kidneys there is no typical picture to be seen which is characteristic. A considerable number of conditions may be met with. If a kidney is completely destroyed by disease there will be no urogram, due to the fact that there is no excretion of the contrast substance on that side. If the affected kidney is enlarged but functioning the outline of the enlarged kidney will frequently be delineated much better than without any contrast substance, the uroselectan B as it is being excreted by the glomeruli causing a general opacity of the kidney parenchyma. Cortical tubercular abscesses can be diagnosed, due to the fact that the kidney containing the contrast substance stands out prominently around the abscess.

In cases of tuberculous pyonephrosis in which the pelvis is affected there is seen irregularity and dilatation of the pelvis and calyces. The pictures seen are no different from pyonephrosis from other causes than tubercle, therefore do not help in diagnosis; other corroborative evidence must be sought, *e.g.* T.B. in urine.

It is also most important to take a series of skiagrams at intervals, as when there is disturbance of kidney function there may be considerable delay in the appearance of the contrast substance on the affected side as compared with the healthy kidney. Dilatation of the ureter, especially of the upper part, is commonly seen in tubercle. Constriction of the ureter due to tubercular ulceration has been

observed. This must be diagnosed with caution, because a single skiagram of a normal case may show the contrast substance in the ureter suddenly stop at a given spot without any constriction, due to the ureter being in a state of systole at this spot, whereas the part above containing the contrast substance is in diastole. It is only when the uroselectan B stops at the *same* spot in a series of skiagrams that pathological constriction of the ureter can be diagnosed with any degree of certainty.

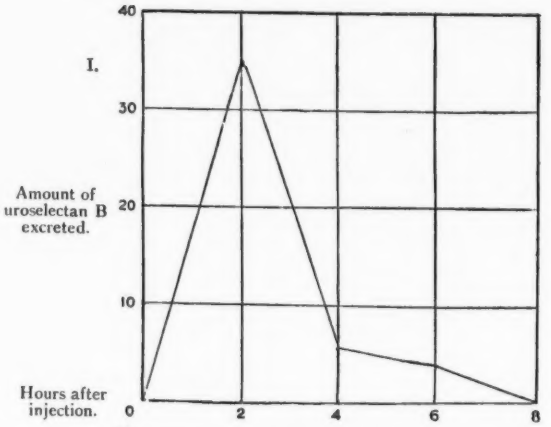
Lichtenberg, whose experience of excretion urography extends to over 2,000 cases, is able to diagnose early tuberculosis of the calyces by this method, and owing to his wide experience recommends removal of diseased kidney after intravenous urography alone without any cystoscopic examination. He maintains that excretion urography, blood retention tests, and the finding of T.B. in the urine are all the necessary data required.[9]

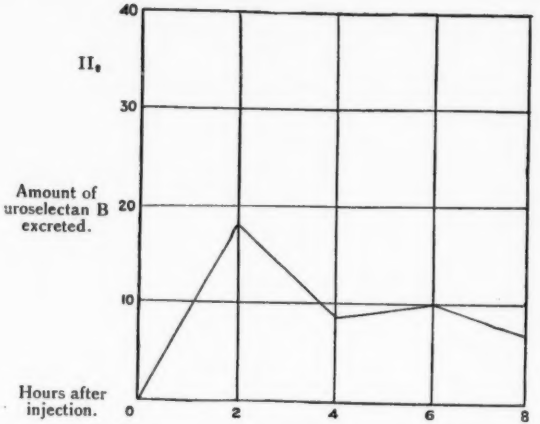
However, in my opinion, without a considerable experience of a large number of cases it is extremely difficult to diagnose *early departures from the normal*, as although anatomically the calyces are divided into upper, middle and lower groups, one frequently meets with considerable variants of this without any disease, and the shape of the normal pelvis is not by any means constant. Anatomical peculiarities of the ureter are also common: it may be twisted on itself or duplicated, but when the disease is well established valuable information can be obtained concerning the actual condition of the kidneys and ureter.

Further information of the kidney function can be obtained by estimating the amount of uroselectan B in the urine. It is excreted in the urine unchanged as a sodium salt and can be precipitated by the addition of 1 part of concentrated hydrochloric acid to 4 parts of urine. The precipitate is a white substance—free dicarboxylic acid. This is dried and weighed. Healthy kidneys excrete uroselectan B fairly rapidly, and the maximum rate of excretion may be reached 2 to 3 hours after injection. It then falls rapidly, and at the end of 10 hours none is to be found in the urine; whereas in disease the rate of excretion may be delayed considerably, and uroselectan B may be found in the urine as long as 17 hours after injection.

Dr. Deane, my assistant, has done a series of estimations of uroselectan B in the urine. Specimens of urine voided at intervals of 2, 4, 6 and 8 hours after injection were examined, and these are some of the graphs he has prepared.

Graph I.—A typical one of healthy kidneys, the chief characteristic being that the maximum peak of excretion is reached 2 hours after injection. This is followed by a rapid drop, and at the end of 8 hours after injection all excretion has ceased.


I.
40
30
20
10
0
2
4
6
8
Amount of uroselectan B excreted.
Hours after injection.


II.
40
30
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2
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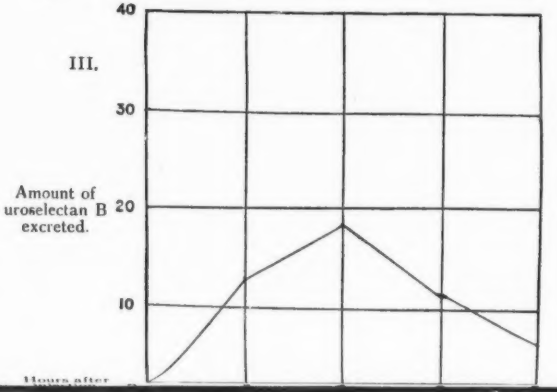
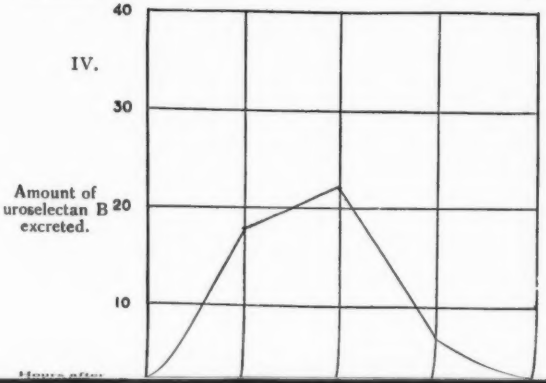
6
8
Amount of uroselectan B excreted.
Hours after injection.


III.
40
30
20
10
Amount of uroselectan B excreted.


IV.
40
30
20
10
Amount of uroselectan B excreted.

Graph II.—A case of tubercle of the left kidney. This kidney was not functioning at all, as there was none of the contrast substance showing in any of the skiagrams on the left side. It will be seen that although the maximum rate of excretion in this case is reached 2 hours after injection, it is only 19 on the scale as against 34 for the normal case (roughly half), and there is not the sudden drop as in Graph I, but the curve gradually comes down, and at the end of 8 hours uroselectan B is still being excreted.

Graph III.—A case of tubercular pyonephrosis of the left kidney. It is very similar to Graph II., except that in this case the maximum peak of excretion is reached 4 hours after injection instead of 2. The curve is a gradual one as compared with the normal one (Graph I.), and at an interval of 8 hours uroselectan B is still being excreted.

Graph IV.—A case of early tubercular disease of the left kidney presenting similar characteristics to Graphs II. and III., except that the curve is somewhat higher and more uroselectan B is being excreted, and excretion has ceased at 8 hours, showing that the function, although impaired compared with the normal, is better than the second and third cases. Other things being equal, the case would be a more favourable one for operation than Nos. II. and III.

A rough idea of the rate of excretion can be obtained by estimating the specific gravity of the urine. In healthy kidneys the specific gravity rises to 1,050 or 1,060 during the period of maximum excretion, and falls to 1,030 towards the end of the excretory period, although the time that the highest specific gravity is reached does not absolutely coincide with the time of maximum excretion but lags a little behind.

The amount of uroselectan B in the blood has been measured. In healthy kidneys there is none in the blood after 4 hours: ·5 gramme in the blood after 4 hours indicates minor disturbance of the kidney function. A higher amount indicates more severe damage.

In a series of 9 cases of renal tuberculosis which were definitely diagnosed before the injection of uroselectan B (8 of them had T.B. in the urine), considerable variations from the normal were noted in every case in the skiagrams. These included abscesses of the kidney, pyonephrosis, dilatation of the ureter, stricture of the ureter, and total destruction of the kidney substance.

It will thus be seen that intravenous urography is a most useful aid to diagnosis in tubercle of the kidney, and gives valuable information both as regards the anatomical condition of affairs and also the functioning of the kidney.

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9. *Ibid.* 2

THE CAUSES AND TREATMENT OF PLEURAL EFFUSION AND EMPYEMA.

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IT is usual to regard pleural effusion either as an exudate, that is to say inflammatory, or as a transudate. A true transudate is not of an inflammatory nature but may be produced by passive congestion, as occurs in cardiac failure where it is aggravated by the recumbent position of the patient. Pressure on the vena cava, azygos major or pulmonary veins are additional causes. The liquid is usually pale yellow, has a low specific gravity, very little coagulable protein, and what few cells it contains are endothelial. In most cases the condition is complicated by some inflammatory changes so that the effusion is not entirely a transudate. This may be shown by the examination of the liquid in many so-called transudates associated with intrathoracic neoplasm, renal affections or other forms of chronic disease. A pleural exudate is most commonly due to tuberculosis, but it may be part of a general serositis or an extension from inflammation in the lung or neighbouring organs situated above or below the diaphragm. A preponderance of small lymphocytes in the effusion indicates tuberculosis. Pleural exudation in connection with other chronic infections, such as syphilis in which there would also be an excess of these cells, is so rare as to be almost negligible. A preponderance of polymorphonuclear leucocytes indicates pyogenic infection, but is also found in tuberculous cases with spontaneous pneumothorax. An excess of eosinophil cells is regarded as evidence against tuberculosis, and if found in a clear effusion after pneumonia suggests that the liquid will not become purulent and therefore points to a good prognosis.

The following list shows the variety of conditions under which pleural effusion occurs: Tuberculosis, pneumonia, influenza, intrathoracic tumour, cardiac failure, renal disease, cirrhosis of liver, leukæmia, Hodgkin's disease, rheumatism, acute general infections, pulmonary infarct, chronic intrathoracic infections such as syphilis or actinomycosis injury to the thoracic duct or filariasis, cysts, such as dermoid or hydatid, encysted empyema, and sub-diaphragmatic infections such as gastric ulcer, sub-diaphragmatic abscess, liver abscess, appendicitis, etc.

Pleural effusion definitely follows injury or exposure to cold in some cases, and is then almost always of a tuberculous nature. So many people have severe chest injuries or great exposure to cold without developing pleurisy or effusion that at the most these can be regarded as only contributory causes in some one already infected.

Rheumatic fever is common in the wards of a hospital, but pleural effusion is practically unknown as a complication unless there is also pneumonia or cardiac failure. So-called idiopathic effusion is almost always tuberculous though often wrongly called rheumatic. Typhoid organisms or coli bacilli are sometimes found in pleural effusions but are probably not the direct cause. If a typhoid patient develops a tuberculous effusion typhoid bacilli will probably be present. I have seen patients with an empyema full of bacillus coli, but which started as a clear tuberculous effusion. Empyema following pneumonia is occasionally contaminated by coli bacilli, and although they give a most offensive odour to the pus a good recovery usually follows operation and drainage as in the case of an ordinary empyema.

A clear pleural effusion is sometimes found as a complication of encysted empyema and may be very misleading. Recently I saw a man of sixty-five who developed an acute illness in Scotland which was diagnosed as bronchitis. He improved and returned to London but developed a temperature and signs of a right pleural effusion. About 10 ounces of blood-stained fluid were aspirated and the temperature fell, but rose again in a few days. He was again aspirated and several ounces of similar fluid were withdrawn. The heart was displaced to the left and X-ray suggested that he still had a large pleural effusion. He was once more aspirated, but on this occasion through the axilla and not the back, and a large quantity of pus was found.

When pleural effusion develops after an abdominal operation the possibility of subphrenic abscess must be borne in mind. I once saw a lady from South America who was suddenly taken ill whilst shopping in London. Two days later she was acutely distressed and a quantity of clear fluid was aspirated from the right pleural cavity. She was found to have a liver abscess with amœbæ in the stools and rapidly recovered under treatment.

When no fluid is found on exploring a case with signs and symptoms suggesting pleural effusion or empyema a neoplasm should be suspected, especially if the exploring needle goes through material which feels like cork. I saw one such case which proved to be due to actinomycotic infection.

Encysted or interlobar empyema may be difficult to find on exploration, but in these cases X-ray examination usually clears up the diagnosis. A blood-stained effusion may be found in any condition, but is most common in the subjects of a neoplasm. Endothelioma of the pleura produces a large effusion which rapidly reforms after each aspiration. Carcinoma of the lung may lead to effusion and sometimes to empyema.

Mediastinal tumours commonly cause an effusion which is often a transudate from pressure on veins. In this case the possibility of a dermoid cyst must be borne in mind because it can usually be successfully removed even if the case appears clinically and on X-ray examination to be quite inoperable.

True chylous effusion resulting from obstruction to the thoracic duct is very rare. It smells of digested food, goes on to putrefaction and contains fat globules which clear on shaking with a fat solvent. A chyliform or pseudo-chylous effusion has been met with in certain cases of neoplasm or in sufferers from chronic tuberculosis. In these cases the liquid does not smell or putrefy, nor can it be made to clear by a fat solvent. Cholesterol crystals are sometimes found in long standing cases of tuberculous effusion ; they give to the liquid a golden irridescent appearance, but have no effect on prognosis or treatment.

Syphilis should not be diagnosed as a cause of pleural effusion. I have seen one case in which a mediastinal gumma was found on post-mortem examination, and a few similar cases have been described, but they are extremely rare, and some authorities deny that such a condition exists.

Having dealt with the less common conditions under which pleural effusion occurs, I shall now consider briefly the treatment of the usual forms.

1. *Influenza.*—In any epidemic of influenza a number of cases of pleural effusion are seen whether or not there has been pneumonia. The liquid should be aspirated, and except in the very acute cases recovery is the rule. Sometimes the liquid becomes purulent, when operation and drainage are necessary. Operation should never be performed before the effusion becomes purulent.

2. *Broncho-pneumonia.*—A cloudy effusion may develop during the height of broncho-pneumonia, especially the type of disease associated with influenza. This is streptococcal in origin and goes on to true pus. In the early stages it is essential to avoid operation, but aspira-

tion is necessary. If, as often happens, the liquid reaccumulates and true pus forms, operation and drainage become necessary. To operate in the early stages leads to an open pyothorax and a high mortality. During the big epidemic of influenza of 1918 the mortality from streptococcal empyema was reduced from 61·2 to 9·5 per cent. by aspiration instead of immediate operation.

3. *Lobar-pneumonia.*—Pneumococcal empyema should be treated by operation and drainage, but the empyema cavity should be constantly irrigated by Dakin's solution to avoid the risk of chronic empyema. A clear effusion often occurs in the early stages of pneumonia, but for this no treatment is required. The possibility of an encysted empyema must not be forgotten.

4. *Cardiac Affections.*—Effusion in cases of cardiac failure should be aspirated. The presence of even a small quantity of effusion throws a great strain on the heart.

5. *Tuberculosis.*—An effusion of unknown origin should be regarded as tuberculous, and the principles of treatment are *not* to aspirate unless: (*a*) There is extreme dyspnœa. (*b*) Temperature persists or the general condition of the patient is bad after six weeks. (*c*) There is active disease in the underlying lung, and it is desired to create an artificial pneumothorax. (*d*) There is active disease in the opposite lung which is becoming worse owing to the effusion.

A tuberculous effusion must be taken as evidence of disease in the lung, and in some 40 per cent. of cases active pulmonary tuberculosis develops. In most cases the effusion is absorbed and the patient appears well, but sanatorium treatment or at least a strict routine open-air life under medical supervision is essential in these cases. When pulmonary tuberculosis follows effusion it usually does so within three and rarely after five years.

A tuberculous empyema is a serious condition although the patient may remain in apparently good health for a long time. Treatment should consist in aspiration and washing out the pleural cavity with Dakin's solution in order to get the lung to reexpand. If the lung will not expand and a chronic tuberculous empyema results thoracoplasty should be performed if the state of the other lung and the general condition of the patient permit.

When tuberculous effusion occurs as a complication of artificial pneumothorax it should be left unless it causes symptoms of embarrassment or unduly displaces the mediastinum, in which case it should be aspirated and replaced with gas. It has been said that the golden rule is that there is no golden rule. If there is an exception to this platitude I think it is that pleural effusion of unknown origin should always be regarded as tuberculous, and that consequently steps should be taken to prevent activation of the lesion in the lung.

THE TUBERCULOUS CRIPPLE.

By W. B. FOLEY,

O.B.E., F.R.C.S.,

Assistant Surgeon Wingfield-Morris Orthopædic Hospital, Oxford.

Among the diseases whose end-result is the production of a cripple tuberculosis of bone and joints must still be given a regrettable prominence in this country, owing both to the number of its victims and to the extent of suffering and deformity of which it is the direct cause. The incidence of tuberculous disease in children and adults shows little decrease with the years. The total admissions for the year for tuberculosis (non-pulmonary) to the Wingfield-Morris Orthopædic Hospital at Headington, Oxford, were as follows:

Years.	Adults.	Children.
1922	33	31
1927	53	44
1932	34	24

A study of the Registrar-General's figures of the incidence of bovine tuberculosis and of the mortality from this type of disease makes melancholy reading.

Carefully compiled tables based on these returns and published in the Report of a Special Committee appointed by the People's League of Health in 1930 to make a survey of tuberculosis of bovine origin in Great Britain show that on a very conservative estimate at least 4,000[1] fresh cases of infection calculated to be due to the bovine tubercle bacillus occur annually, and that about 2,000 children die every year from all forms of tuberculous infection of bovine origin.

The undisputed fact that milk infected with the bovine bacillus is the chief source of this type of infection in human beings explains the marked preponderance of its victims among the children of the nation, and stresses once more the urgent necessity of continued striving towards the ideal of providing a pure milk supply at a cost within the reach of the poorest consumer without financial loss to the producer. This problem seems at present insoluble, and in any case much time must elapse before the ideal of prevention is attained. I am more concerned at present with the consideration of our present methods of dealing with established tuberculous disease. To what extent can we prevent or limit crippledom in children and adults infected with tuberculosis of bone or joints? Is the treatment of

[1] "Report of a Special Committee appointed by the People's League of Health to make a Survey of Tuberculosis of Bovine Origin in Great Britain." (People's League of Health, 12, Stratford Place, London, W.)

these cases by the conservative method of immobilization in open-air hospitals, which has been almost universal for some twenty years now, entirely satisfactory in its results? Recent investigations show that, if by results we mean end-results, the answer to this question is definitely in the negative. Smith and Watters[1] in 1928 summarized the end-results of 150 cases of tuberculosis of the hip treated at the country branch of the New York Orthopædic Dispensary and Hospital over a seventeen-year period from 1904 to 1921, and followed for three years or longer after discharge from hospital, as follows:

(1) Thirty-six patients, or 24 per cent., died, the majority from tuberculosis.

(2) Seventy-one cases, or 47 per cent., were still active when last examined.

(3) Forty-one cases, or 27 per cent., were quiescent with little or no motion and with some degree of deformity.

(4) Only two patients were free from symptoms and had a useful range of motion.

Girdlestone[2] in the same year stated that out of 30 children with tuberculosis of the hip who had left the Wingfield-Morris Orthopædic Hospital more than a year previously, 2 had relapsed and been re-admitted; 13 had free movement and no splintage; 11 had a hip that was fixed or greatly limited in movement, and were still in a splint; and 4 were at home without a splint with a hip fixed or with greatly limited movement: these 4 had all been out of hospital more than three years. Of the 15 cases with fixed hip or limited movement there had been an increase of flexion or adduction deformity in all but 3 of the cases since they had left hospital.

There is thus a serious discrepancy between the condition of these children when they leave hospital and when they are re-examined at the end of varying time periods, during which they have been exposed to the environment of their own homes, frequently very poor, and to the stresses and strains of their ordinary existence.

It is obvious that under these circumstances the hospital "cure" does not long remain one in fact, though it probably continues to figure as one in the records of that particular hospital. If death does not take place from tuberculous dissemination, local recurrence of activity or increasing deformity necessitates readmission, which may not be to the same hospital as before, thus falsifying statistics, giving rise to an erroneous estimate of the efficacy of conservative methods alone, and a feeling of satisfaction with results by no means justified by the facts.

[1] Smith, Alan D., and Watters, W. H., *Journal of the American Medical Association*, vol. xc., No. 3, January 21, 1928.

[2] Girdlestone, G. R., "Arthrodesis and other Operations for Tuberculosis of Hip." (Sir Robert Jones's Birthday Volume, p. 347.)

To avoid this it is highly desirable that the country should be divided up into districts each with its central orthopædic hospital or orthopædic department of a general hospital with country branch, to which cases are admitted from that district only, and not from urban centres at the other end of England, from which they can be kept under regular observation by the establishment of a chain of clinics, and to which they return if relapse or deformity necessitates further surgical treatment. All cases, except the comparatively few who change districts, can thus be kept under constant expert supervision, and statistics taken from the records of these hospitals would give a much truer presentation of the end-results of treatment.

Many such organizations are already in existence and have been doing good work for a number of years, and others are in process of formation, so that this scheme is gradually but surely approaching completion, and forms a most essential first step in limiting the ravages of established tuberculous infection of bones and joints.

The second and equally important step is the early diagnosis and notification of obvious *or suspected* cases of tuberculosis by general practitioners and tuberculosis officers, so that early admission to the central hospital, for confirmation of diagnosis and the institution of treatment on correct lines, may take place with as little delay as possible. The importance of this time factor, especially in the case of children, can hardly be over-estimated, as it may mean the saving of movement in an affected joint.

Finally, there is the question of the best method of treatment of the case after admission to hospital and confirmation of the diagnosis by clinical tests and radiography, supplemented by tuberculin reactions, such as that of Mantoux, or in certain cases diagnostic arthropsy.

This is far too big a subject for discussion in any detail here, but the consensus of modern opinion among orthopædic surgeons and others concerned in the treatment of these cases is that, though purely conservative treatment by immobilization in the open air is necessary in every case, and sufficient in itself in a considerable number of cases of disease limited to synovial membrane, yet where there has been much bone destruction, surgical treatment is an indispensable adjunct. In cases of joint disease where there has been considerable destruction of cartilage and bone the ideal of healing with restoration of movement has vanished, and has to be replaced by the second best of healing with sound fixation by bony ankylosis of the joint in the position which experience has shown to be the best for subsequent function. The usual result of destructive tuberculosis of a major joint such as the hip is an unsound fibrous ankylosis, owing partly to the accumulation of tuberculous granulation tissue, necrotic cartilage and bone debris between the bone ends, and partly to the depressing effect on

osteogenesis exerted by the tubercle bacillus on the bone in its neighbourhood.

The aim of the modern operation is therefore—(1) To eliminate tuberculous material and bring raw bone surfaces into close apposition; and (2) to promote osteogenesis by bone grafting, usually extra-articular in the case of joints or at a distance—*e.g.*, by fusing the spinous processes in cases of disease of the vertebral bodies. In very general terms the younger the patient the more likely are conservative methods alone to succeed, especially where disease is limited to soft parts. In childhood the time factor of duration of treatment is of little account, since in all properly constituted orthopædic or country hospitals education by certificated teachers goes hand in hand with treatment.

Surgical interference is most often indicated in childhood in hip disease with much bone destruction, as these joints frequently will not ankylose by bone for years, cannot be adequately held by any form of ambulatory splint, and will not stand the strain of normal existence without recurrence of activity or production of deformity.

In adults, tuberculosis of bones or joints is always a more serious disease, almost malignant in its tendency to recurrence and an insidious advance, and it should always be dealt with surgically and as radically as possible, even to the extent of amputation of a limb, especially in patients past the third decade. The time factor in a wage-earning adult is a matter of great importance, and surgery offers a means of cutting down the necessary period of hospitalization.

These patients, especially the children, are frequently very poor surgical risks, and much care and judgment is called for in the selection of the best time for operation in relation to length of general treatment and the local radiographic appearances. An irreproachable operative technique as regards asepsis, anti-shock precautions, gentleness in manipulation, speed and effective immobilization before, during, and after operation is essential.

To sum up: early discovery and notification of tuberculous disease and its treatment in special hospitals by adequate general measures combined with efficient and specialized surgery, in cases where this is indicated, offer the tuberculous cripple his best chance. Already much limitation has been set to the disability previously associated with the disease, and many adults with tuberculosis of the spine, or of a major joint, have been enabled by treatment on these lines successfully to hold their own in the open labour market, and attain the economic independence and self-respect which mean even more to the cripple than they do to the rest of mankind.

ASSOCIATIONS AND INSTITUTIONS.

THE WINGFIELD-MORRIS ORTHOPÆDIC HOSPITAL.

THE following account of means for the treatment of surgical tuberculosis in the wards of the Wingfield-Morris Orthopædic Hospital at Headington, Oxford, has been kindly furnished by Mr. W. B. Foley, F.R.C.S., assistant surgeon to the hospital.

WINGFIELD-MORRIS ORTHOPÆDIC HOSPITAL: NEW WARDS.

Terrace with beds in the open. View looking towards the east.

The Wingfield-Morris Orthopædic Hospital has recently been entirely rebuilt and modernized throughout, owing to the generosity of Sir William Morris, who has defrayed the whole cost of construction. The hospital has 140 beds, of which about 60 per cent. are in use for the treatment of surgical tuberculosis in children and adults. The equipment includes two modern operating theatres, X-ray room, plaster room, massage and physiotherapy rooms, gymnasium and a brine bath. The wards for the most part are of the one-storey flat-roofed type, square in shape and entirely open on their southern sides. The east and west sides consist largely of freely opening windows, and even the north side, out of which open the various offices, has a dado of window which can be opened to give the all-important through ventilation. The ward floors are continuous with a concrete solarium outside to the south on to which the beds are easily run out when the weather conditions are suitable. Between each pair of wards is a warmed "recovery" ward where cases are taken after operation for a day or two, and where dressings, minor operations and various nursing

procedures are carried out. In these wards patients suffering with tuberculosis of bone and joints live entirely in the open air. Every day their bodies are exposed to direct sunlight or to skyshine and air on dull days, for longer or shorter periods according to the time of year. This exposure of the body to sun and air has been definitely proved to stimulate metabolism and increase vitality, and is the indispensable general treatment of practically every case of surgical tuberculosis, wherever the local lesion may be situated. The diet is planned on very generous lines, and cod-liver oil is administered as a routine. The treatment of the local lesion varies with its site, but consists essentially in immobilization, complete, prolonged and uninterrupted

WINGFIELD-MORRIS ORTHOPÆDIC HOSPITAL: NEW WARDS.

View towards the west. The patients in their beds are pushed right out on to the concrete solarium, which runs along the whole south side of the wards. In front of this is a stretch of grass used for games and sports—much appreciated by the patients in the rôle of spectators.

by means of orthopædic frames or plaster of Paris. The nursing of patients immobilized for such lengthy periods on apparatus demands a specialized orthopædic training, and ceaseless watchfulness and attention to detail in order to prevent the production of deformity or of pressure sores. Surgery now plays a large part in the treatment of tuberculosis of bone and joints. The operations consist mainly in the elimination of diseased tissues and the subsequent internal but extra-articular splinting of diseased spine, or fixation of disorganized joints by some form of bone-grafting. These patients are often very poor surgical risks in spite of preceding general treatment, and a high standard of technique is required to bring about a successful issue. Attached to the hospital are the workshops, where some thirty lads, too severely crippled to find employment in the ordinary way, are trained according to their capabilities in boot making and repairing, carpentry and metal-work. All splints and apparatus used in the hospital and its clinics are made in these shops.

NOTICES OF BOOKS.

CONTINENTAL WORKS ON TUBERCULOSIS.

DRS. ASCOLI AND LUCACER have issued a small monograph providing a concise and useful summary of our knowledge of the treatment of pulmonary disease by the production of simultaneous collapse of both lungs.[1] After a short historical account of the development of the idea, which was first suggested by Ascoli and Fagiuoli in 1912, they discuss the mechanism of artificial pneumothorax, quoting the experimental observations of the best-known authorities on this subject. The indications and contra-indications are clearly set forth, and a general account is given of the main principles which must guide the physician in the technique of the method and in the conduct of the case. A useful bibliography is supplied. In an appendix at the end of the book the advantages are indicated of primary artificial pneumothorax undertaken in the contralateral lung. To anyone taking up the difficult subject of bilateral pneumothorax this little book is a most helpful introductory work. The X-ray reproductions are clear and instructive, but the notes of the actual cases quoted are perhaps rather sketchy. The introduction of fuller detail into the clinical notes would, we think, have added considerably to the practical usefulness of the work, which, however, in other respects is one of considerable merit.

MAURICE DAVIDSON, M.D., F.R.C.P.

Drs. Bourdellès and Jalet, in the preface to their book dealing with pulmonary tuberculosis involving the azygos lobe, express the opinion that the whole study of supernumerary lobes needs amplification.[2] This task they have undertaken with no little success, and have provided a careful and satisfying account of the anatomical and radiological aspects of these unusual phenomena and their relation to tuberculous disease. Attention has been directed more especially in the last few years to this subject, and the work of MM. Bourdellès and Jalet is a valuable addition to its literature. In the first two chapters the description of the embryology and anatomy of the azygos lobe of the lung is rendered the more helpful by well-executed diagrams More use of diagrams is employed in Chapter III., and this, in our opinion, is of the greatest practical assistance in the study of the excellent reproductions by which they have illustrated their account of the radiology of the condition. The last two chapters are devoted to the azygos lobe in tuberculosis of the lung and to tuberculosis of other supernumerary lobes. These also are well illustrated, and the radiograms are effectively reproduced on good paper. The book includes an adequate account of the history and literature of the subject, and a good bibliography is appended. The study of unusual conditions in medicines has often contributed in no small degree to the understanding of problems of general medical interest. To anyone concerned with diseases of the lungs and desirous of keeping up to date with modern investigation we would strongly commend this work.

MAURICE DAVIDSON, M.D., F.R.C.P.

[1] "Le Pneumothorax Bilateral Simultane." By M. Ascoli et M. Lucacer. Pp. 104, with 11 illustrations. Paris: Masson et Cie. 1932. Price 22 frs.

[2] "La Tuberculose du Lobe Azygos." Bourdellès et Jalet. Paris: Masson et Cie. 1933.

Drs. Rieux and le Bourdellès have contributed a work to the series which deals with various aspects of tuberculosis, and is edited by Professors Chantemesse, Poncet, Collet, and Piery.[1] The authors lay stress on the significance of the physiological unity of the recticulo-endothelial system, and, as a corollary, on the importance of study of the blood, lymph glands, spleen, and bone marrow in relation to tuberculosis as a key to our understanding of the problem of immunity in this disease. They make no claim to a complete or exhaustive account, but in their volume the reader will find a very useful summary of the results of experimental inoculation and of the different clinical varieties resulting from infection of lymph glands, spleen, and marrow with tuberculosis. Although no startling conclusions have been reached—and this is, perhaps, hardly to be expected in the present state of our knowledge—the authors have succeeded in putting clearly before the reader the conceptions involved in the study of tuberculosis infection considered from the point of view of tissue reaction as a whole, and especially as a problem in humoral pathology. There is a considerable bibliography, which adds to the value of the book as a work of reference. MAURICE DAVIDSON, M.D., F.R.C.P.

Professor Sayé has published in the "Bibliothèque de Phtisiologie," edited by Professor Léon Bernard, an illuminating work on the subject of pleural adhesions in connection with artificial pneumothorax.[2] It should command the attention of workers in this field at the present time, because the success or failure of Forlanini's operation may depend upon the skill with which certain adhesions are dealt. Given that a case of pulmonary tuberculosis has, after careful consideration, been considered eminently suitable for collapse therapy, an adhesion may arise which may mar the whole success of the treatment and possibly even serve to discredit a valuable form of treatment. In carefully selected cases, thanks to the original work of Jacobeus and the further improvements introduced by Maurer of Davos, collapse therapy has been placed on a firmer basis, and the advantages derived therefrom made more practicable. It is good to note that the work of Chandler in this country is recognized, for few have done more than he to bring the subject of adhesion-cutting before British medical advisers. The book, based as it is on judicious practical experience, is teeming with valuable information. Every aspect of the subject of pleural adhesions is adequately dealt with, clinical, anatomical, instrumental, operative, and therapeutic. What is so pleasing is the well-balanced attitude adopted towards the management of individual cases. Indications and contra-indications are emphasized; no extremism is permitted. It is only in this way that a valuable form of treatment, with its definite limitations, is not brought into disrepute. The volume is richly illustrated, and the author is to be congratulated on having presented so valuable and practical a book in such a sound and well-balanced manner. PHILIP ELLMAN, M.D., M.R.C.P.

[1] "Tuberculose des Organes Hematopoietiques." By J. Rieux et B. le Bourdellès. Paris: G. Doin et Cie. 1933.

[2] "Pneumolyse Intrapleurale: L'opération de Jacobæus et la thoracocaustie d'après Maurer dans le pneumothorax artificiel." By Louis Sayé, Professeur à la Faculté de Médecine de Barcelone. With Preface by Professor Léon Bernard. Pp. 242, with 119 figs. Paris: Masson et Cie, 120, Boulevard Saint-Germain. 1932. Price 40 fr.

Dr. J. Morin's thesis presented to the Medical Faculty of Lausanne deserves consideration.[1] It deals with 321 cases of pneumothorax under investigation from the end of 1925 to the end of June, 1930, and 174 cases of phrenicectomy from the end of 1925 to September, 1930. The results are very much the same as those published by other observers. For example, out of the 321 pneumothorax cases, 173, or 54 per cent., were much improved ; 86, or 27 per cent., were stationary ; and 62, or 19 per cent., were definitely worse. Dr. Morin's cases showed incidence of fluid is not widely different from the experience of other writers—viz., 113, or about 35 per cent. In the phrenicectomy cases, 174 in number, marked improvement occurred in 58 per cent., 32 per cent. were stationary, and 10 per cent. became definitely worse. Dr. Morin's brochure is a valuable contribution to the large amount of literature on these subjects. It is, moreover, accompanied by some very good X-ray pictures. JANE WALKER, C.H., M.D.

Dr. Beintker's new work merits careful study.[2] It is a well-known fact that in the industrial diseases of the lungs—the pneumonokonioses —a patient may have extensive lung changes with comparatively few symptoms. This is particularly the case in silicosis, when a subject with marked lung changes both clinically and radiologically may emphasize his sense of well-being and freedom from symptoms. Dr. Beintker emphasizes the necessity, in dealing with the subject of legislation from the point of view of compensation, of giving prime consideration to the degree of physiological as opposed to anatomical change in the pneumokoniotic subject. To him the degree of respiratory embarrassment is all-important, and not the extent of pathological change as seen in a radiogram. Whilst this may be true from the point of view of the ultimate prognosis, the most reliable single piece of evidence is undoubtedly the radiological evidence, and this would appear to be inadequately appreciated.

PHILIP ELLMAN, M.D., M.R.C.P.

SURGICAL TUBERCULOSIS.

Under the auspices of Professors Grove, Fromme, and Warnehros there has recently been issued a work on the surgery of tuberculosis.[3] The author is Dr. Flesch-Thebesius. The book is one of a series of medical and surgical monographs which aim at giving modern and concise views on the subjects dealt with. Dr. Flesch-Thebesius has confined his comments to the surgery of bone and joint tuberculosis, and has divided the book into two sections. The first part deals with general considerations of pathology and treatment, including a valuable critique on the G-H-S salt-free diet, while the second part is devoted to the consideration of individual bones and joints. The book is useful as a work of reference, and aims at giving assistance to practitioners

[1] "Du Pneumothorax à la Phrénicectomie." By Dr. Jean Morin, of Leysin, Switzerland. Pp. 35, with 30 skiagrams. Paris: Masson et Cie, 120, Boulevard Saint-Germain. 1931. Price 20 fr.

[2] "Die schwere Staublunge in der Versicherungsgesetzgebung." By Dr. Erich Beintker. Berlin: Julius Springer, 23-24, Linkstrasse. 1933. Price R.M. 7.50.

[3] "Chururgische Tuberkulose." By Dr. Med M. Flesch-Thebesius. Mit einem Geleibwort von Professor Dr. V. Schmieden. Pp. xiv+194 mit 58 Abbildungen. Dresden: Theodor Steinkopff, Residenzstrasse 32. 1933. Price R.M. geheflet 15, gebunden 16.20.

who themselves have to undertake treatment. Duration and selection of treatment are carefully discussed with this object in view, and in general the subject-matter conforms closely with present-day English teaching. The influence of Rollier is noticeable throughout most of the work, and a general impression is given that the results of conservative treatment are more favourable than we are accustomed to look for. The illustrations are clear and adequate, and a short bibliography is included, though this, as is so often the case in German medical works, practically ignores English and American literature.

T. Holmes Sellors, F.R.C.S.

CAUSAL FACTORS IN TUBERCULOSIS.

This comprehensive report, compiled by Dr. Bradbury under the auspices of the National Association for the Prevention of Tuberculosis, is indeed a useful contribution.[1] The report is a crystallization, in eminently readable form, of the facts which emerged from a long and painstaking inquiry undertaken by Dr. Bradbury during 1931-32 in the two Tyneside areas of Jarrow and Blaydon. The geographical areas of the inquiry were well chosen, as is evident from the reasons for their selection as stated in an early part of the report. The report throws much light upon the subject of tuberculosis ætiology. It does so more in the form of weighty evidence in support of long-recognized ætiological factors than in the suggestion of new ones. In a work of this kind, however, novelty can hardly be expected. A careful sequence of facts, and a smooth way of telling them, nevertheless ensure that the sister quality of freshness is not lacking. Dr. Bradbury's work appraises fully the various social and sanitary circumstances having relation to the tuberculosis problem, and assigns to each its relative degree of importance. The evidence adduced, for example, to show the connection between tuberculosis and domestic overcrowding is overwhelming. Poverty is shown as more a cause than a result of tuberculosis. The report finds no evidence of "tuberculosis houses"—that is to say, of house-to-tenant infection. It is interesting to note that the considerable proportion of Irish folk in the Jarrow population is deemed to be a major factor in the high incidence of tuberculosis in that town. This conclusion is not drawn without ample and arresting evidence in support. All medical officers of health will be gratified to read a statement contained in the report to the effect that the incidence of tuberculosis in families containing children who were supervised at M.C.W. Centres is definitely less than in families containing children not so supervised. This appears to be a testimony to the value of maternity and child welfare work which cannot pass unnoticed. A feature of the report throughout is the patent care in the use of statistics and in the conclusions drawn from them. The report warrants a wide circulation.

Arthur Massey, M.D.

TUBERCULOSIS AMONG SOUTH AFRICAN NATIVES.

An elaborate publication issued last year by the South African Institute and edited by the Director, Sir Spencer Lister (Vol. V.,

[1] "Causal Factors in Tuberculosis." By F. C. S. Bradbury, M.D., D.P.H. Pp. 126. London: The National Association for the Prevention of Tuberculosis. 1933. Price 2s.

No. XX.), contains much valuable information regarding the prevalence of tuberculosis among native labourers in South Africa.[1] It is the Report of the Tuberculosis Research Committee originally established by the Transvaal Chamber of Mines, and later expanded into a Joint Committee by incorporation of representatives of the Union Government. The Research Committee contained a number of medical, engineering and other local experts, and Colonel S. Lyle Cummins, David Davies Professor of Tuberculosis in the Welsh National School of Medicine at Cardiff, acted as adviser and consultant. The Report opens with an introduction in which is explained the objects and scope of the enquiry. Then follows a preliminary survey of facts bearing on tuberculosis in South African natives. The main substance of the Report deals in seven chapters with Tuberculosis as a Disease of the Native Industrial Population in South Africa of To-day. Here is included much general information regarding problems of health and disease in connection with the gold-mining industry. Then follow records relating to the Incidence and Mortality from Tuberculosis on the Rand. A particularly valuable section is devoted to a consideration of Prophylactic Measures, and here Professor Lyle Cummins furnishes a valuable commentary. Appendices provide a number of important communications dealing with anthropological features, tuberculin tests, bacteriological investigations, clinical types, X-ray films, and the prevalence of tuberculosis in domestic animals. Such a brief exposition of the more conspicuous features of this monumental Report will be sufficient to indicate its importance. We would, however, direct special attention to the series of recommendations of the Committee regarding Anti-Tuberculosis Measures in the Native Territories. The Committee point out that the health problems of the native population are intimately bound up with those of the European population, and that in dealing with the problem of public health there can be no separation of the various races in South Africa into separate compartments. Finally it is advised that in order to ensure continuity of policy in the investigation and application of suitable anti-tuberculosis measures on the mines in South Africa the Chamber of Mines should appoint and maintain a standing Health Committee. It is urged that the duty of this Committee should be to advise what health statistical returns should be kept by those responsible for the mines.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Colonel Robert J. Blackham has quickly followed his fine volume, "London for Ever: The Sovereign City—its Romance, its Reality," by an equally impressive work on India.[2] This beautifully produced book with its attractive and instructive illustrations is timely in its appearance, and should be read by all at home and abroad desiring reliable

[1] "Tuberculosis in South African Natives, with Special Reference to the Disease amongst the Mine Labourers on the Witwatersrand." Pp. 429, with map, charts, photographs, radiographs, tables and bibliography. Johannesburg, South Africa: The South African Institute for Medical Research. 1932.

[2] "Incomparable India: Tradition; Superstition; Truth." By Colonel Robert J. Blackham, C.B., C.M.G., D.S.O. With a Foreword by Field-Marshal Sir William Birdwood, Bart., G.C.B., G.C.S.I., G.C.M.G., C.I.E., D.S.O., M.A., LL.D., D.C.L., Master of Peterhouse, Cambridge. Pp. xviii + 302, with maps and illustrations. 1933. Price 12s. 6d.

information regarding India and its peoples. As the Master of Peterhouse indicates, Colonel Blackham has admirably set forth the manners and customs of the dwellers in the great sub-continent with sympathy and understanding. His skilfully expressed studies will appeal to all sorts and conditions of readers anxious for guidance in forming opinions regarding India. We would specially commend the work to medical practitioners, for it contains much valuable information relating to hygienic and medical matters. There is a particularly enlightening chapter on "The Divine Art of Healing" in which particulars connected with medical services are presented. There is also a revealing chapter on "Drink and Drugs." "Incomparable India" is a notable work which no British citizen can afford to miss.

The publishers of *Amateur Gardening*, the weekly popular journal relating to all matters connected with a garden, have issued a companion annual for 1933.[1] This admirably produced publication should be in the hands of everyone who lives, possesses, or is privileged to work in a garden. It contains a large number of practical articles, many charming illustrations, and a collection of notes all arranged according to the order of the year's work.

The Lane Publications have issued a popular manual which seeks to afford rational and serviceable guidance in the prevention of "the common cold."[2] By means of exercises and hygienic measures, which are described in simple words and illustrated, the author believes the susceptibility to catching cold may be in great measure controlled.

"Nudism in England,"[3] by the Rev. C. E. Norwood, B.A., sets forth the aim of a movement which, particularly in Germany, has exercised some influence on the social life of a number of enthusiasts, and which it is claimed is of service in developing and maintaining a high standard of health under open-air conditions. Mr. Norwood, after an introduction on sun-bathing and nudism, deals with his subjects in two chapters on "Nudism and the Sex Taboo" and "Light, Clothes, and the Body," and then describes the movement for nudism as manifest in this country. An appendix contains information regarding existing centres where information respecting the practice of nudism can be obtained.

The 1933 issue of the Federation of Rambling Clubs' Official Year Book,[4] the offices of which are at 7, Buckingham Palace Gardens, S.W. 1, is a reference work in which holiday ramblers and health seekers in cars or on bicycles or as walkers will find much practical information. All members of the brotherhood of the open air should secure a copy. In addition to signed articles relating to rambles at home and abroad there are helpful bibliographies, practical notes, and a serviceable directory.

[1] "Amateur Gardening Annual, 1933: A Review of the Year's Work in Garden and Greenhouse." Edited by A. J. Macself, Editor of *Amateur Gardening*. Pp. 122, with numerous illustrations. London: W. H. and L. Collingridge, Ltd., *Amateur Gardening* Offices, 148-149, Aldersgate Street, E.C. 1. Price 2s. 6d.

[2] "Thou Shalt Not Catch Cold: A Duty to Yourself and to Your Neighbour." With a Foreword by Alexander Francis, M.B., B.Ch. Pp. 32, with illustrated chart. London: The Lane Publications (*Daily Express* Books Department), 23, St. Bride Street, E.C. 4. 1932. Price 1s.

[3] "Nudism in England." By the Rev. C. E. Norwood, B.A. Pp. 48. London: Noel Douglas, 28-30, Little Russell Street. 1933. Price, paper 1s.; cloth, 2s.

[4] "The Ramblers' Handbook: Being the Official Year Book of the Federation of Rambling Clubs for the Year 1933." London: E. J. Larby, Ltd., 30, Paternoster Row, E.C. 4. Price 6d.

PREPARATIONS AND APPLIANCES.

THE NEW REPELLO CLINICAL THERMOMETER will be appreciated by doctors and nurses and all who use a clinical thermometer.[1] It provides a means whereby the mercury column can be quickly brought

THE REPELLO CASE WITH CLINICAL THERMOMETER.

The illustration indicates the ingenious mechanism for the setting of the instrument.

down by centrifugal force. The guide lines define the mercury column, which can be read at a glance even by those unaccustomed to the handling of a thermometer. The Repello case is nickel-plated, compact, and furnished with a spring pocket-clip.

THE VONO PATENT FOLDING TABLE is a novelty which will be welcome not only in ordinary households, but for use in hospitals, sanatoria, open-air schools and other institutions, and for service indoors and outdoors.[2] We are using one of these tables, and can unhesitatingly commend it as the best form of folding or collapsible, all-purposes table known to us. To see one is to desire one. For almost every kind of use where a small table is required the Vono may be recommended. At each corner on the lower surface is a reliable self-locking metal catch, which can be readily fixed and easily opened. The table is strong, durable, graceful in form, efficient, and the legs, when folded, fit accurately and neatly into the under surface of the table-top, thus taking the minimum amount of space in storage. The wooden portion of the table can be supplied in various colours with the top surface covered with green baize or other material. (The prices are 16s. 9d., 18s. 3d., and 29s. 6d. for the super models.)

THE GAMAGE BED-TABLE AND READING-STAND COMBINATION[3] is a practical one which for patients in hospitals, sanatoria, nursing homes, and other institutions, as well as for service in a person's own home,

[1] The Repello Case and Thermometer is manufactured by Becton, Dickinson and Co., Rutherford, N.J., U.S.A., and can be obtained from Chas. F. Thackray, Park Street, Leeds.

[2] Particulars regarding the Vono Patent Folding Table can be obtained from the manufacturers, The Vono Company, Dudley Port, Staffordshire.

[3] The Gamage Bed-Table and Reading-Stand Combination with the Gamage Bed-Rest can be obtained from A. W. Gamage, Ltd., Holborn, E.C. 1.

will be most welcome. It is an ideal gift for an invalid, and is constructed as a bed-table, legs folding flat: all is of wood with polished Jacobean finish. There is a central portion which can be elevated and

GAMAGE BED-TABLE AND READING-STAND.

adjusted to provide a convenient book-rest. (The price is 6s. 11d.) A useful adjunct is the GAMAGE BED-REST, which has a frame of wood and a support of canvas, and the slope can be readily adjusted. (The price is 2s. 11d.)

The SERVEX TRAY TABLE is a novelty with real utility which has found much favour in private houses, but deserves to be better known and used in hospitals, sanatoria, and nursing homes.[1] It will also be of service in connection with open-air schools and for picnics when motoring. The tray is provided with legs which, by an ingenious, simple mechanical trigger-release arrangement easily set in motion by the carrier of the tray, can be lowered or raised, instantly converting the tray into a rigid reliable table, and *vice versa*. Various models are available in different colours, with legs plain, moulded, or square, with either nickel or chromium plated or copper oxidized fittings. The dimensions of the tray are 25″ × 16″ with legs 21″ long, and a special bed-table model is made with legs 9″ long. (The prices range from 15s. to 21s.)

THE "TIDY HOLD-ALL" CUSHION BAG is a novelty which only needs to be seen for its merits to be evident.[2] It will be welcomed everywhere, and will be of special service for patients and invalids who want to keep books and papers and other personal belongings together in a handy receptacle. The bag is made of strong, durable, artistic tapestry, well padded and fitted with a zipp fastener. It will be useful as a cushion, especially when travelling in train or motor. The bag is of a practical size, 16 in. × 14 in. It can be obtained in antique leather and real morocco, and in all colours. (The prices range from 10s. 6d. to 21s.)

THE OTTERBURN SCARVES are a new and popular speciality coming from the Little Old Mill in Otterburn, Northumberland, founded in 1921, and noted through the years for the excellence of its rugs and homespuns.[3] The Otterburn Mill, Ltd., formerly Messrs. W. Waddell and Sons, are to be congratulated on their enterprise in providing

[1] Particulars regarding the Servex Tray Tables can be obtained from the manufacturers, Messrs. Felix Heilbronn, Ltd., 43, Tabernacle Street, E.C. 2.

[2] The "Tidy Hold-All" Cushion Bag is made by Henry W. Boote and Bro., 112, Church Street, W. 8.

[3] Particulars of the Otterburn specialities can be obtained from Otterburn Mill, Ltd., Otterburn, Northumberland.

artistic, hygienic and serviceable products likely to have the blessing of doctors and all others interested in beautiful, durable and effective materials for clothing. The new Otterburn scarves are ideal for those who need comfort and protection. They provide charming gifts for doctors, nurses and patients in sanatoria and elsewhere. These charming scarves are beautifully made from finely-spun merino wool, and are beautifully light, soft and comforting. They are available in a wide range of many differing colours. (The price is 5s. 9d.)

THE MYATT "DAYMARK" SAFETY RAZOR SET[1] is neat, strong, durable and effective, and is available at a price so low that it is within the reach of all who desire to possess a reliable safety razor. In design, construction and service this popular razor meets all requirements. It is particularly suited for patients in hospitals, sanatoria and elsewhere. It should be noted that the Myatt razors and blades are manufactured in England by a British company. (The price is 2s. 6d.)

THE "GIENIC" FOOD COVERS are hygienic equipments which should be available in every home and institution.[2] They are made of fine, washable muslin in combination with rustless steel springs, and provide fly-proof, dust-proof protection for milk and other dietetic materials. (Price of set of four covers, 1s.)

THE APOLLO COAL TONGS furnish a new, effective, strong and durable appliance for the safe and convenient handling of coal.[3] It is a form of tongs which only requires to be used to be appreciated, for, designed ingeniously and skilfully constructed, it enables portions of coal to be easily gripped and moved from scuttle to fire by the movement of one hand. This novel gripper is constructed of finely tempered steel copper finished or in polished steel. (The price is 4s.)

THE "KOOKSANDEE" OVEN TONGS is an indispensable appliance for the kitchen and wherever cooking has to be undertaken.[4] It is a cleverly constructed, strong, durable, and very effective gripper whereby all kinds of hot utensils can be held and carried without discomfort or danger of burning the fingers. (The price is 9d.)

THE FLETCHER SWITCH ATTACHMENT is a serviceable novelty which is finding much favour with persons who desire to be able to control the electric switch from their bed.[5] It is a little appliance which can be carried in the pocket and is readily fixed and detached from the switch wherever this may be situated in relation to the bed. (The price is 2s., post free.)

THE MOSELY RUBBER TRUNCHEON is an agent of protection which we recommend to the notice of doctors, nurses, motorists and others who may be in danger from the attacks of bandits, house-breakers and other anti-social offenders.[6] It consists of a heavy stout rod of rubber,

[1] Particulars regarding the Myatt "Daymark" Safety Razor and Blades can be obtained from W. J. Myatt and Co., Ltd., Argent Works, Birmingham.

[2] The "Gienic" Food Covers are supplied by Clarkes (Redditch), Ltd., Sinew Works, Redditch.

[3] The Apollo Coal Tongs are manufactured by Accles and Pollock, Ltd., Oldbury, Birmingham.

[4] The Kooksandee Oven Tongs is manufactured by Clarkes (Redditch), Ltd., Sinew Works, Redditch.

[5] The Fletcher Switch Attachment is supplied by Fletcher and Co, Mowbrick Lodge, 170, Cheltenham Road, Bristol.

[6] The Moseley Rubber Truncheon is manufactured by D. Moseley and Sons, Ltd., Chapel Field Works, Tipping Street, Ardwick, Manchester.

12 inches in length (a longer one of 16 inches is also available). At one end is a leather strap by means of which it can be readily held and slung up in the house, car, or in any convenient situation. (The price is 4s. 6d., and 6s. for the larger size.)

THE LITTLE GIANT SCYTHE will be of service for patients undergoing occupation therapy and for healed tuberculous and other subjects who have restricted powers and have to be careful in the conduct of their horticultural activities.[1] It is constructed of Sheffield steel, strong, light, and easy to handle.

THE HILTONIA SPRING PILLOW occupies a unique position among bed equipment.[2] It is soft and yielding and adjusts to every movement of the head. This is due to the patent spring within built on the cantilever principle. The centre strip of spring steel has outstanding cross-stays placed at right angles, allowing perfect freedom of action without any noise and bending either crossways or lengthways just like an ordinary pillow. The steel laths are enclosed in a calico cover. The pillow is also provided with a device which allows for thorough ventilation. It can be stuffed with mare's or horse's hair, artificial silk or kapok as may be desired. Feathers are not used, which is a desirable exclusion for many asthmatics. We have tried this pillow and can thoroughly commend it. For many patients, delicate subjects, and especially those who are suffering from tuberculosis or other chronic affections and troubled by insomnia, the new Hiltonia Spring Pillow will be a great comfort. (The prices range from 12s. 6d. to 18s. 6d.)

VITREOSIL WARE fashioned from fused silica can now be obtained in a variety of forms.[3] This new flame-proof lustre cooking ware has many advantages: it is heat-proof, easy to clean, pleasing in appearance, cannot contaminate food, and is of British manufacture. We warmly commend this attractive and not unduly expensive ware for use in hospitals and sanatoria, as well as for ordinary domestic service.

THE LIFE-LONG PROPELLING PENCIL made in England is a "Priaur" production, which will be of service to doctors, nurses, and patients, as well as all others desiring an effective pocket pencil.[4] It is available in various forms in gold and silver and rolled gold. It is ingeniously constructed and made to contain a supply of standard refills. (The price ranges from 4s. to £2 2s.)

The AQUASCUTUM COATS are so well known and universally appreciated that a short reminder to readers of this JOURNAL will be sufficient to direct attention to this form of equipment as a desirable one for doctors, patients, and those who, in connection with professional work and sanatorium or like services, require adequate, pleasing, and reliable protection when living an open-air life.[5] The Aquascutum models are

[1] The Little Giant Scythe is manufactured by Thos. Staniforth and Co., Ltd., Hackenthorpe Works, Sheffield.

[2] Particulars regarding the Hiltonia Spring Pillow can be obtained from the makers, Hilton Brothers, Lombard Mills, 74 and 75, Townsend Street, Dublin, Ireland.

[3] Particulars regarding Vitreosil and its various uses can be obtained on application to the Thermal Syndicate, Ltd., Wallsend-on-Tyne, Northumberland; or from the London Depot, Thermal House, Old Pye Street, S.W. 1.

[4] The Life-Long Propelling Pencils are manufactured by W. H. Collins and Co., Excelda Works, Rookery Road, Handsworth, Birmingham.

[5] Particulars regarding the various Aquascutum models can be obtained on application to Aquascutum, Ltd., 100, Regent Street, W. 1.

designed both for men and women, town folk, and all classes of sportsmen, motorists, travellers, and country dwellers. From personal experience we can testify to the merits of the Aquascutum specialities, and we would particularly commend them to the attention of members of the medical profession.

FILIVEX is a new preparation of fish liver which promises to be of much service in dealing with cases of both primary and secondary anæmia.[1] It is made at the Glaxo Laboratories in accordance with the technique described by Professor L. S. P. Davidson, and is available in liquid and powder forms. Certain fish-liver extracts have a marked hæmopoietic influence, and seem to act as promptly as preparations of mammalian liver and cost considerably less. Filivex is highly potent and quite palatable. The results obtained in cases of pernicious anæmia have been conspicuously good. It seems probable that Filivex may be found of service in selected cases of tuberculosis.

ESSOGEN[2] is a new form of concentrate of vitamin A prepared in the biological laboratories of Lever Brothers, Ltd., and formerly known as Lever's Preparation Y. It is the outcome of many years of research, and is an exceptionally potent concentrate of vitamin A, having a blue value of 2,000, representing 200 times the vitamin A content of a good cod-liver oil. It has been tested by distinguished investigators and workers in connection with the Medical Research Council. Essogen can now be used as an effective prophylactic or anti-infective agent, and in massive doses has been shown to possess high therapeutic value in dealing with a number of diseases in which the liver reserves of vitamin A suffer rapid exhaustion. As dietaries are far too often deficient in vitamin A, essogen must be regarded as a normal nutrient. In cases of tuberculosis, essogen therapy promises to be of considerable service, and particularly in young subjects. Essogen is available in 2-minim capsules in tubes of 50, and in hospital bottles of 500.

THE VIKING SPECIALITIES merit the consideration of doctors and others interested in the study of nutrition and the ordering of dietetic preparations both for the sound and the sick.[3] "Slimhelth," a new crispbread made from rye, barley and wheat, is a delicious form of wafer which will be welcomed by those living a hygienic life and enjoying meals in the open. It will be of service in hospitals, sanatoria and open-air schools for children, and can be taken at any meal or when motoring, hiking or picnicking, with or without butter, savouries and the like, or in other forms. The preparation is nutritious and rich in vitamin B. "Slimhelth cheese" is another acceptable novelty, being made from goat's milk, and is popular as a desirable nutrient for tuberculous patients. When cut into wafers with a special cutter provided and taken with "Slimhelth," it forms a dietetic delicacy which is much appreciated by children and invalids as well as by the vigorous.

PLASMON and Plasmon preparations have for long found favour in the management of tuberculous patients, delicate infants and children,

[1] Particulars regarding Filivex can be obtained from Glaxo Laboratories, 56, Osnaburgh Street, N.W. 1.

[2] Full particulars regarding Essogen may be obtained on application to the sole distributors, Trufood, Ltd., Union House, 26, St. Martin's-le-Grand, London, E.C. 1.

[3] "Slimhelth" preparations are supplied by Viking Vitamins, Ltd., 12A, Priory Street, Monmouth.

convalescents, and subjects of malnutrition.[1] Plasmon is rich in pure protein and other elements for body building. It is readily assimilated and can be added to various foods, increasing their nutrient and tonic value. Plasmon contains essential vitamins and is a supplementary food which only needs to be used in sanatoria, open-air schools and elsewhere to be fully appreciated.

ZIXT is a special form of soap tablet for removing grime, grease, stain and other dirt from the hands, leaving them soft and smooth.[2] Doctors, nurses and others will appreciate it, and it will be found of particular service in hospitals, sanatoria, open-air schools, and other institutions, as well as for ordinary domestic workers. Zixt is also effective for cleansing artificial teeth, paintwork, cars, baths, and for use after gardening.

THE GULLIVER FOOT-BAG RUG is an admirable companion for all who travel, and will be particularly serviceable for patients undergoing open-air treatment.[3] One design consists of a foot-bag lined with sheepskin and with associated rug. It is made all in one piece. There is a lightning zipp fastener up the front. Perfect protection from all draughts is insured. Two pockets are provided in the rug, and in connection with the bag is a receptacle for books and papers. All can be packed up quickly into a small, portable parcel. The Gulliver can be obtained in various forms, sizes, and materials, as well as in different colours. (The prices range from 25s. 6d. to 75s. 6d.)

VIROL[4] is a long-established nutrient which has proved of much service in the treatment of tuberculous children and consumptive adults. It is essentially a body-builder, a nutrient possessing valuable properties making for vitalizing of the normal body as well as restoration of the enfeebled and disordered frame. It is composed of marrow-fat, glycerine extract of red bone marrow, malt extract, eggs, lemon syrup, salts of lime and iron with a definite vitamin content. Virol is a preparation rich in materials for normal development as well as the repair of diseased and disordered tissue. VIROLAX is of service in assisting cases of constipation, particularly such as are enfeebled by tuberculosis disease. It is an emulsion of pure liquid paraffin 60 per cent. per volume with Virol of 40 per cent. In addition to its laxative action it appears to have a bactericidal action in preventing and arresting intestinal toxæmia and disorders arising therefrom.

Those who require a saline which is efficacious as a mild aperient and yet pleasant to take will find LINGFORD'S LIVER SALTS[5] admirably suited to their requirements. Containing anhydrous magnesium sulphate, anhydrous sodium bicarbonate and tartaric acid, it effervesces strongly and dissolves immediately. It also contains a certain quantity of cane-sugar, which will naturally appeal particularly to those who frequently have to administer it to children.

[1] Specimens and particulars of Plasmon preparations may be obtained by medical advisers on application to Plasmon Limited, 66A, Farringdon Street, E.C. 4.

[2] Zixt is manufactured by John Knight, Ltd., the Royal Primrose Soap Works, Tidal Basin, E. 16.

[3] Particulars regarding the Gullivers can be obtained from the makers, Susan Inventions, Ltd., 6, Cliveden Place, S.W. 1.

[4] Particulars regarding Virol and allied preparations can be obtained from Virol, Ltd., Hanger Lane, Ealing, W. 5.

[5] Lingford's Liver Salts are manufactured by Messrs. Joseph Lingford and Son, Bishop Auckland, Co. Durham.

THE OUTLOOK.

THE COMMON COLD.

THE common cold remains a mystery. In spite of all researches this world-wide ailment still continues to attack mankind. We continue labouring in the dark as regards prophylaxis and treatment, although every sufferer has no difficulty in describing the handicap and misery inflicted by the common cold. Our present knowledge regarding the common cold has been admirably summarized in a monumental work issued from the Pickett-Thomson Research Laboratory by David Thomson, O.B.E., M.B., Ch.B., D.P.H., Hon. Director, and Robert Thomson, M.B., Ch.B., Pathologist.[1] This impressive work is Vol. VIII. of the Annals of the Pickett-Thomson Research Laboratory, and forms Monograph XV. published from this centre of scientific inquiry. The work is encyclopædic, and is based upon information presented in some 2,000 research papers dealing with the subject. The authors have also embodied the results of their own researches carried out over a period of fifteen years. A vast amount of valuable information is set forth in orderly array. It is interesting to note that the authors in the course of their work at the Pickett-Thomson Research Laboratory have collected 500,000 original papers and abstracts, and have classified them under about 10,000 headings. The matter composing the great work on the common cold is admirably presented, arranged in no less than forty-nine sections, opening with an introduction on the importance of research on the common cold and closing with a remarkably complete bibliography. Pathologists, clinicians, medical officers of health, and intelligent laymen will be grateful to the authors for their courage, industry, and scientific skill in producing such a fine reference work. This subject of the common cold is of great importance in regard to tuberculosis, for there is no doubt that pathological states connected with the common cold prepare the human soil for invasion by the tubercle bacillus. Drs. D. and R. Thomson deal in detail with all the factors connected with the common cold and allied states. An illuminative chapter is devoted to the consideration of the part played by chill in the causation of colds. In regard to predisposition thereto, bad ventilation, fatigue, unsatisfactory diet, non-hygienic clothing, and other factors are helpfully discussed. There is an important chapter on nasal sinusitis following colds and influenza. The question of treatment receives consideration, and many serviceable practical suggestions are set forth. After an addendum, in which much up-to-date information is effectively presented, the authors

[1] Annals of the Pickett-Thomson Research Laboratory, Vol. VIII. "The Common Cold: With Special Reference to the Part Played by Streptococci, Pneumococci, and Other Organisms." By D. and R. Thomson. Pp. xxiv + 738. Published for the Pickett-Thomson Research Laboratory, St. Paul's Hospital, 24, Endell Street, London, W.C. 2, by Baillière, Tindall and Cox, 7 and 8, Henrietta Street, Covent Garden, W.C. 2, and in America by the Williams and Wilkins Company, Baltimore, U.S.A. 1932. Price £3 3s. ($15.00).

provide an excellent summary with conclusions. We advise all clinicians to read this section, for it contains much that is of practical value. Future research workers will be thankful for the very helpful collection of bibliographical references. Much praise must also be given to the series of fifty-one beautiful plates. There is also an index of authors quoted and an excellent index of subjects. We have nothing but admiration and praise for the enterprise shown by Dr. D. Thomson and Dr. R. Thomson in producing this encyclopædic volume, which provides a sure foundation on which future research workers will be enabled to build and as we trust effectively.

NOTES AND RECORDS.

The 19th annual conference of the National Association for the Prevention of Tuberculosis is to be held at Cardiff on July 13-15 under the presidency of Sir Robert Philip. The principal discussion will be on the part played in the production of tuberculosis respectively by (1) infection and (2) environmental conditions. Dr. Ralph M. F. Picken, Medical Officer of Health for Cardiff, will open the discussion, which will include references to the findings of the Naticnal Association's Tyneside inquiry and to investigations by the Welsh National Memorial Association regarding the high death-rate from tuberculosis in Caernarvonshire and Merioneth.

The Research Department of the Brompton Hospital for Consumption and Diseases of the Chest has issued a valuable report on "A Reinvestigation of Children Previously Examined by Tuberculin Tests."

The National Association for the Prevention of Tuberculosis is rendering a valuable service by the periodical issue of educational leaflets and other publications. The latest is entitled "On Leaving the Sanatorium," and is suited for presentation to patients who have undergone institutional treatment.

The Health and Cleanliness Council, 5, Tavistock Square, continue to issue excellent educational publications. One of the latest is addressed to girls, and is entitled "Help Yourself to Health and Beauty."

A 1933 edition of "The Gardens of England and Wales" has recently been issued, providing a directory classified by dates and alphabetically arranged to those private gardens which this season will be open to the public in aid of the Queen's Institute of District Nursing. The volume has a preface by Christopher Hussey, and is published for the Queen's Institute of District Nursing, 58, Victoria Street, S.W. 1, by Country Life, Ltd., 20, Tavistock Street, W.C. 2 (price 1s.). The handbook is delightfully illustrated, and we advise every garden lover and philanthropically minded reader to secure a copy.

We have received from the Institut Pasteur, 25, Rue Dutot, Paris, a copy of "Compte rendu Analytique des Travaux des Laboratoires de Recherches sur la Tuberculose Effectués en 1931-1932," issued under the direction of Dr. A. Calmette and many collaborators by Masson et Cie, 120, Boulevard Saint-Germain. The work contains communications on experimental researches on B.C.G. and other tuberculosis studies.

Tuberculosis Abstracts continue to be issued as "A Review for

Physicians" by the American National Tuberculosis Association, 450, Seventh Avenue, New York City. The issue for May dealt with "Pulmonary Tuberculosis and Syphilis"; that for June with "Tuberculosis in the Negro"; and that for July with "Tuberculosis Infection."

The Medical Press and Circular for July 12 is a Special Tuberculosis Number dealing with "Modern Methods of Diagnosis and Treatment," and containing a Foreword by Sir Humphrey Rolleston, and articles by Sir Henry Gauvain, Dr. L. S. T. Burrell, Mr. H. Morriston Davies, Dr. G. Barrow Dowling, Mr. V. E. Negus, and Dr. J. L. Livingstone.

The Institute of Ray Therapy and Electro-Therapy, 152, Camden Road, N.W. 1, the Medical Director of which is Dr. William Beaumont, has issued an interesting illustrated Report of its work for the past year.

The Oxfordshire Association for the Prevention of Tuberculosis, formed by Sir William Osler in 1910, has issued the 22nd Annual Report, containing details regarding valuable work carried out in Oxfordshire. The secretary is Miss Price, 49, Banbury Road, Oxford.

Messrs. Schall and Son, Ltd., 75. New Cavendish Street, W. 1, have issued a descriptive and admirably illustrated brochure, "X-ray Accessories."

"The Good Companions," published by Thomas Black and Sons (Greenock), Ltd., is an excellent illustrated Guide to Camping and Hiking, and a copy may be obtained on application.

Colonel ffennell's paper on "Wytham Country Schools, near Oxford," which appeared in the April number of this JOURNAL, can now be obtained as a reprint on application to the publishers (price 3d.).

We have been favoured with copies of *Revista de Tuberculosis del Uruguay*, the "organo oficial de la Sociedad de Tisiologia" and "organo del Servicio de Lucha y preservacion Antituberculosa," published at Avenue 18 De Julio 1746, Montevideo. This journal contains articles and illustrations which ably indicate the effective work which is being carried on in Uruguay.

Design for To-Day, published by Week-End Publications, Ltd., 24, Essex Street, Strand, W.C. 2 (annual subscription, post free, 14s.), will interest readers of this JOURNAL. It is charmingly produced, effectively illustrated, and provides much valuable information regarding all matters relating to artistic and practical designing in connection with home, everyday things, and human health and happiness.

Nutrition is the journal of the Glaxo Laboratories issued periodically from 56, Osnaburgh Street, N.W. 1, and a copy will be sent to all medical advisers interested in Glaxo Specialities on application. This journal contains important articles relating to nutritional problems and the service of the various preparations produced in the Glaxo Laboratories, such as Adexolin, Antiviruses, Ostelin, Glucose-D, Ostomalt, and other valuable therapeutic agents.

The Ministry of Health has sanctioned the erection of a Tuberculosis Hospital of 300 beds at a cost of £229,000 at Sully, near Cardiff. The annual cost of maintenance is estimated at £53,000.